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Original Contributions.

DEVELOPMENT OF THE MOUTH AND TEETH, BASED UPON ORIGINAL INVESTIGATION.

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The changes which take place in the process of tooth formation may be divided into two distinct and separate stages: *First*.—The development of the different dental organs, resulting in the formation of the dental follicles, which contain all of the structures out of which the future tooth is to be formed. *Second*.—The deposition of the inorganic salts within the different structures of this dental follicle, resulting in the fully developed calcified tooth.

While the second stage of development, i. e., the process of calcification, is the most difficult to the investigator and requires an almost impossible amount of scientific training, and is indeed the "most difficult subject with which the embryologist has to deal," the first stage or steps in the process, i. e., the changes leading up to the formation of a dental follicle, are the most difficult of comprehension to the student, who, could he but master this preliminary or introductory stage, would find the process of calcification comparatively simple. In the present paper it is therefore intended to take up in minute detail the stages leading up to the process of calcification, with the hope that the entire subject may be rendered simpler and more easy of comprehension.

To my mind there is no subject in operative dentistry of more practical value than a thorough knowledge of dental histology, and there is no subject by means of which we can reason out for ourselves so many of the pathological conditions associated with the practice of dentistry and oral surgery as through a thorough under-

standing of dental embryology. The open door, as it were, to the histology and bacteriology of teeth is through their embryology.

In considering this subject I shall take up the different points in the following order: *First*.—A description of the dental follicle. *Second*.—The development of the embryo up to and including the formation of the oral cavity, with a description of its tissues (histologically) immediately preceding the tooth development. *Third*.—The gross development of the different dental organs composing the dental follicles of the deciduous teeth, together with their minute histological development. *Fourth*.—The development of the permanent teeth. *Fifth*.—The development of the surrounding structures, i. e., bone, peridental membrane, blood vessels and nerves, together with the eruption of the teeth.

The Dental Follicle.—The general trend or tendency of the changes leading up to the formation of the follicle will be rendered more intelligible if we have constantly before us the exact nature of the structures toward which these developmental changes are tending. The dental follicle is made up of three different structures: *First*, The dentin germ, from which and in which, by a deposition of calcium salts, dentin, together with the pulp with its vessels and nerves, is to be formed; *second*, the enamel organ from which similarly fully-formed enamel is developed; *third*, the dental sacculus, from which the cement and peridental membrane develop. The *dentin germ* is shown diagrammatically in Fig. 1, and is made up from without inward of a single row of elongated polygonal cells known as odontoblasts, arranged in the form of a membrane which entirely encircles the remaining portion of the dentin germ. This layer of odontoblasts is more highly developed at the apex of the germ (where the first deposition of calcium salts is to take place) and becomes less and less highly differentiated from above downward until, at the base, they correspond to the undifferentiated mesoblastic cells of the germ. Immediately beneath and internal to this odontoblastic layer is a layer of pear-shaped goblet cells (Fig. 1), while still more internally, and making up the remaining portion of the dentin germ, are numerous small, round, undifferentiated mesoblastic cells, containing numerous small blood islands constituting themselves as the embryonic condition of the future

blood vessels of the pulp. (Fig. 1.) The *enamel organ* (Fig. 1) is composed of three different layers or kinds of cells: The stratum malpighii; stratum intermedium, and the stellate reticulum. The stratum malpighii consists of a single layer of columnar epithelial cells, the most internal of the three layers, lying immediately external to and in contact with the odontoblastic layer of the dentin germ. The stellate reticulum is the most external portion of the enamel organ and consists of several layers of somewhat star-shaped, reticulated epithelial cells, while between the stratum malpighii and stellate reticulum is the third layer, the stratum intermedium (Fig. 1), consisting of two or three layers of cells which shade gradually from the columnar-shaped cells of the stratum malpighii (the internal layer) to the stellate cells of the stellate reticulum (the external layer). These three layers taken together form the structures which later calcify to form enamel. The *dental sacculus*, from which the cement and peridental membrane will develop, is made up of a double layer of small round mesoblastic cells which form a double sac or bag which entirely encloses the enamel organ and dentin germ, and together with the enamel organ and dentin germ completes the structures contained in the dental follicle, which contains in embryo all of the organs of the fully-formed tooth.

In studying the embryology of the teeth the average student is apt to think of the outside structures of the *lower* jaw as being already completely formed, composed of its hard bony tissue, surrounded by its numerous muscular controllers, and permeated and penetrated by its numerous blood vessels and nerves. [Note.—The lower jaw has been used entirely in connection with the present paper: *First*, because the manner of tooth development in the upper and lower jaw is exactly similar; *second*, the lower jaw is not complicated by so many outside structures and is therefore easier of preparation for microscopic study.] With this idea of the fully-formed jaw in mind he will try to conceive of the manner of teeth development and to reconcile the manner of their formation with these contiguous structures constantly before him and already in place, with the natural consequence that he becomes hopelessly confused at the very outset. He must not forget, therefore, that at the time when the tooth germ makes its first appearance there are no

Fig. I

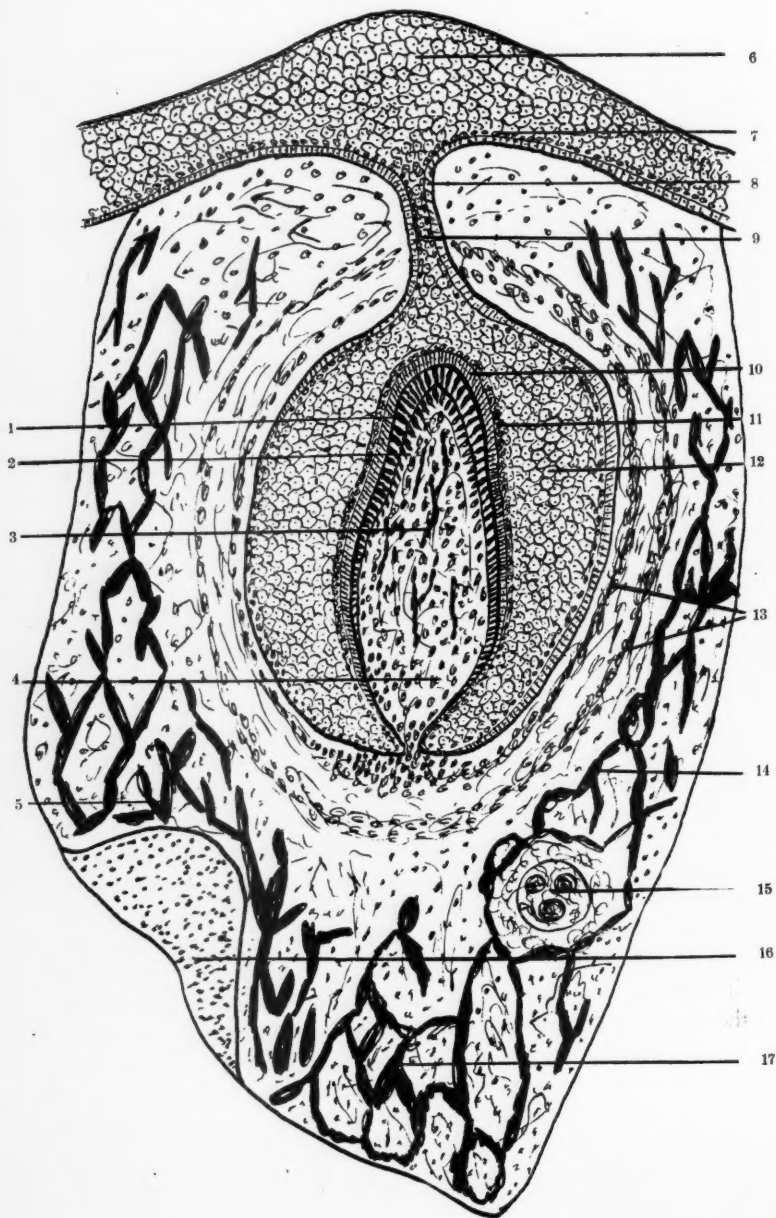


Figure 1. Cross section through the lower jaw, showing the dental follicle fully formed. (Diagrammatic) (1) Odontoblastic membranes. (2) Pear-shaped cells. (3) Blood vessels of the pulp. (4) Undifferentiated mesoblastic cells of the pulp. (5) Developing bone of the lower jaw. (6) Epithelial lining of the oral cavity (stellate reticulum). (7) Stratum intermedium. (8) Stratum malpighii. (9) Epithelial cord of the enamel organ. (10) Stratum malpighii. (11) Stratum intermedium. (12) Stellate reticulum. (13) Sacculus. (14) Developing bone. (15) Inferior dental canal, with its vessels and nerves. (16) Meckel's cartilage. (17) Developing bone.

muscles, no bones, no vessels or nerves, nothing in fact but simple, soft, undifferentiated organic tissue, bearing not the slightest resemblance, even in form, to the adult inferior maxilla. At the time which marks the first appearance of the tooth germ the lower jaw consists simply of an undifferentiated mass of mesoblastic tissue cells, surrounded completely, i. e., internally in the oral cavity and externally around over its external surface, by a layer of epiblastic cells, the epiblastic cells of the oral cavity corresponding exactly with the epiblastic integument which surrounds and completely covers the body. These structures, i. e., bone, blood vessels, nerves, muscles, etc., even at the time when the dental follicle is completely formed, have only reached the stage of development shown in Fig. 1.

In order that the exact histological nature of these two embryonic tissues, i. e., epiblast and mesoblast, may be clearly understood, inasmuch as the tissues of the teeth, like the remaining structures of the jaw, take their origin from one or the other of these two embryonic tissues, and in order that the student may learn for himself the entire absence of these extraneous tissues, i. e., bone, muscles, blood vessels and nerves, at the beginning of tooth formation, I shall, before taking up tooth development proper, first go back to the simplest form of animal life, i. e., the single cell, and trace briefly the various developmental changes which lead up to the condition seen at the time which marks the first appearance of the dental germs.

Development of the cell.—The simplest form of animal life, and the condition from which all animals originate, is a single cell (Fig. 2 A) composed of a nucleus, imbedded in a mass of protoplasm and surrounded by a cell wall or membrane, and having within itself all the characteristics of a fully-developed animal, i. e., functional activity, the power of self-preservation, and multiplication or

reproduction. We will be concerned simply with the latter function, i. e., multiplication.

First step.—The cell develops or multiplies by a process of seg-

Fig 2

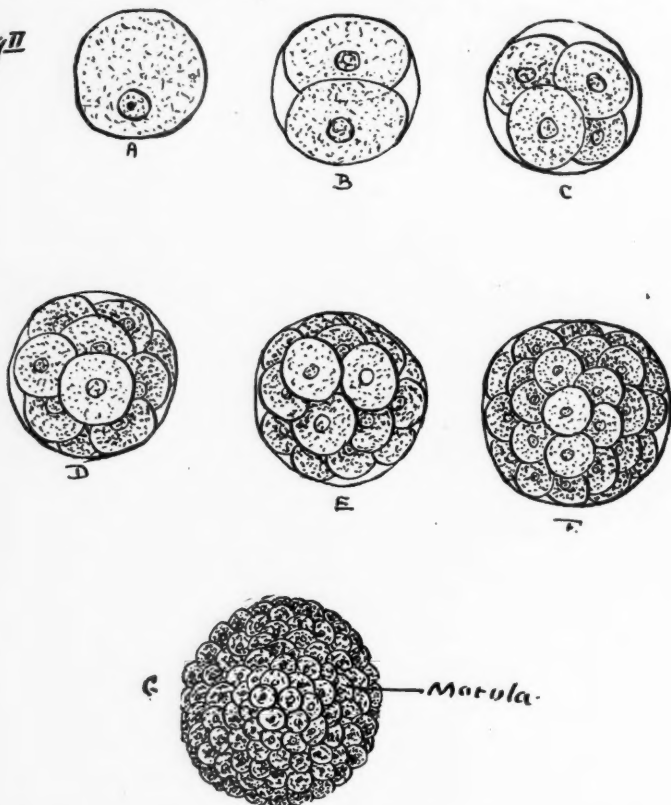


Figure 2. Showing the different stages in the development of the cell up to the formation of the morula (G).

mentation which, beginning in the nucleus, results in the complete division of the cell into two equal parts (Fig. 2 B), each of which, absorbing nutrient matter, soon reaches the size of the original parent cell and then again divides into two cells (Fig. 2 C), and this

process continuing, we get in turn two, four, eight, sixteen, thirty-two, sixty-four (Fig. 2 B, C, D, E, F) and ultimately a solid ball or mass of cells known as the "morula." (Fig. 2 G.)

Second.—The second step in the process of development consists in the absorption of the most central cells of the morula, a small

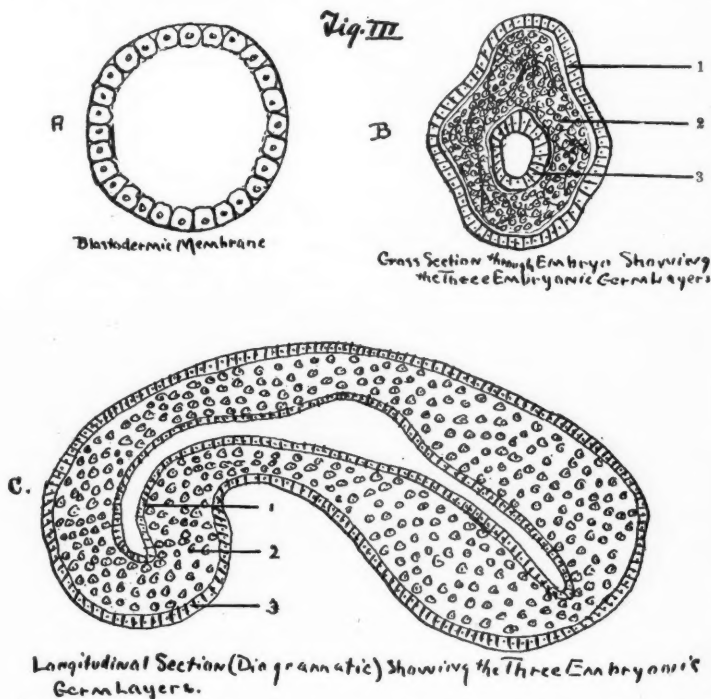


Figure 3. Showing different stages in the development of the embryo. (1) Epiblast. (2) Mesoblast. (3) Hypoblast.

cavity in the center being formed, known as the "cleavage cavity," which as the process of absorption goes on gradually extends to the periphery, until we finally get a hollow sphere surrounded by a single layer of cells and known as a "blastodermic membrane." (Fig. 3 A.)

Third.—This blastodermic membrane divides into three layers, an

external layer or epiblast, an internal layer known as the hypoblast, and a middle layer or mesoblast (Fig. 3 B.) While these three layers are forming the spherical condition of the blastoderm gradually elongates, becomes oblong, canoe-shaped, and finally assumes the form of the embryo shown in longitudinal section (Fig. 3 C). We now have the three embryonic germ layers in place, the three layers from which all the tissues of the body will develop. From the epiblast or external layer develop the entire external covering of the body with all its appendages, the entire nervous system,

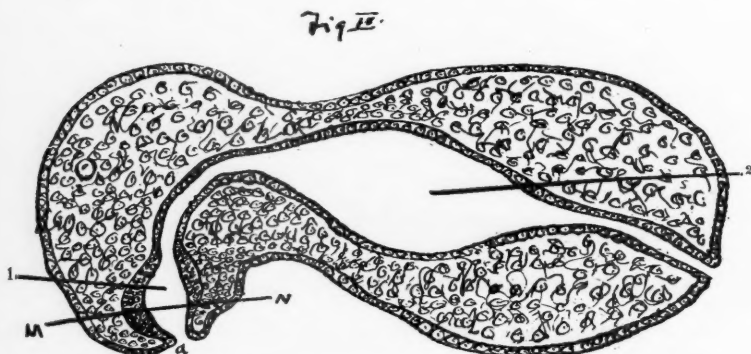


Figure 4. Developing embryo showing the three germ layers and formation of the oral cavity (1). (2) Gastro-intestinal tract, M-N shows the general direction in which the sections used to illustrate this paper were cut.

the oral cavity and the enamel organ of the teeth. From the hypoblast there develop the gastro-intestinal canal, together with all the glandular organs which open into it and the respiratory system—no dental structures. All the remaining organs of the body, including dentin, cement, periodontal membrane, the maxillæ and dental vessels develop from the mesoblast. Consequently in considering the development of teeth we will be concerned simply with the epiblast and mesoblast.

Fourth.—At about the second week the embryo may be represented as shown diagrammatically (Fig. 3 C), there being as yet no mouth, i. e., no connection between the internal germ layer (hypoblast) which is to form the gastro-intestinal tract and the external

layer (epiblast) from which the mouth will develop. At about the fourth week the epiblast in the region of the future mouth (Fig. 4 A) folds inward, forcing the mesoblastic tissue before it, until it comes in contact with the anterior portion of the hypoblast (Fig. 4 B). The two germ layers unite at this point (which is to be the future esophagus) and we then have the formation of the oral cavity in embryo (Fig. 4). The mouth at this stage, therefore, consists of a mass of small round undifferentiated, mesoblastic cells, covered over externally by a single layer of small round undifferentiated, epiblastic cells, the lining membrane of the oral cavity (Fig. 4). *The enamel organ develops from these epiblastic cells, while all the remaining dental tissues develop from the mesoblastic cells beneath.* It must of course be understood that these cells are all in a *formative or changing developmental state*, and differ materially at their various stages of development. The small round epiblastic cells on the surface multiply and accumulate rapidly until they are several layers in thickness. Figure 5 (high magnification) shows the epiblastic cells beneath at a stage just before the beginning of the formation of the enamel organ. It will be seen that both the epiblastic and mesoblastic tissues are composed of an irregularly arranged, homogeneous mass of cells, without as yet any tendency toward a regular arrangement into definite layers. It is only when the dental tissues are far on their way toward formation that the epiblastic cells assume a definite arrangement into layers. To anticipate these minute changes somewhat, inasmuch as our greatest difficulty will be in describing and carrying forward the succession of corresponding *gross* and *minute* changes at the same time, the epiblast will at first be differentiated into two layers, an internal one composed of a single layer of columnar epiblastic cells (the so-called stratum malpighii), and an external mass of polyhedral cells several layers deep (the so-called stellate reticulum, Fig. 11). Still later we will see a third layer assuming form between these two (the stratum intermedium), giving us the three layers of cells: The stratum malpighii, the stratum intermedium and stellate reticulum of the enamel organ. We must remember, however, that these three layers are not completely differentiable until the enamel organ itself has advanced to the condition shown in Fig. 1. The epiblastic

(then epithelial) tissue, having by this time gone through its *formative or changing developmental state*, is fully formed and under higher power of magnification will be seen to consist of three distinct kinds of cells: *First*, an internal or deepest layer, the stratum malpighii, lying immediately in contact with the odontoblasts of the dentin germ, and made up of a single layer of columnar epithelial cells; *second*, the stratum intermedium, a middle layer lying just external to the stratum malpighii, their form shading off gradually

FIGURE V.

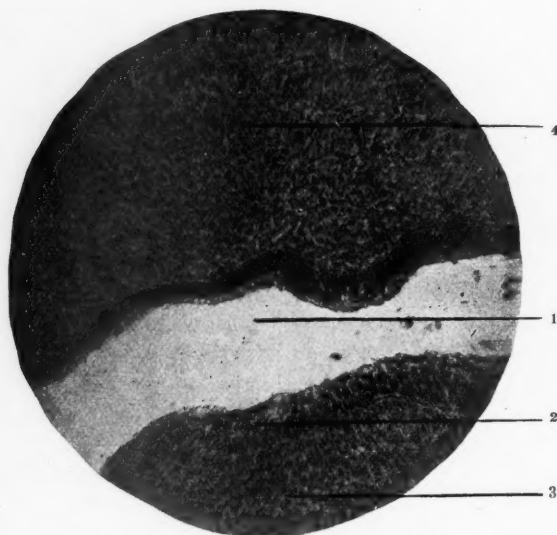


Figure 5. Section through the oral cavity (high power), showing the tissues at a time immediately preceding the beginning of tooth formation. (1) Oral cavity. (2) Epiblastic cells lining the oral cavity. (3) Mesoblastic tissue. (4) Mesoblastic tissue of the upper jaw.

from the columnar cells of the stratum malpighii to the cells of the third layer, i. e., the stellate reticulum. Still more externally is a fourth layer of degenerate hornified, scaly cells, corresponding to the horny layer cast off all over the body, but having no part in the formation of the developing enamel organ. Fig. 1 shows this epi-

blastic and mesoblastic tissue under high magnification. The enamel organ taking its origin from the original epiblastic tissue during its undifferentiated condition, necessarily goes through the same changes just described, and the germ, fully formed, will have assumed the same structure as the tissue from which it originated.

DEVELOPMENT OF THE DENTAL FOLLICLE.

Enamel organ.—At the very outset we will do well to remember two facts: *First*, that the enamel organ is the first dental tissue to develop, governing as it were the development of the remaining dental tissues; *second*, that it takes its origin from the epiblastic cells at the surface of the oral cavity, develops downward into the mesoblastic tissue beneath, severs its connection with the surface epiblast, and remains buried within the mesoblastic tissue for over twelve months, going through the changes which will lead to its complete formation, and then finally retracing its course upward comes again to the surface and cuts through the gum tissue in a fully developed condition. Now to proceed with this development.

About the 40th to the 45th day of embryonic life there appears a slight depression or infolding of the deepest of the epiblastic cells into the mesoblastic cells beneath. This invagination of epiblastic cells, which has been variously named by the different writers on the subject "tooth band," "tooth wall," "maxillary rampart," "dental ridge," "odontogenic layer," etc., etc., marks the first step in the formation of the enamel organ, and is due to the more rapid development of the most internal of the epiblastic cells, producing at first a closer packing of the cells at this point, a momentary halt as the limit of compression is reached, and finally a dipping inward of the more closely packed central cells. Pressure being relieved at this point, the remaining cells develop laterally and follow the original cells down into the underlying mesoblastic tissue. The process is shown diagrammatically in Fig. 6, and results in the condition seen in Fig. 7, which shows its general relation to the rest of the head. Figure 8 shows its minute structure under high magnification. This first indipping begins in the epiblastic cells in the anterior portion of the jaw, and extends backward as a band to the posterior portion of the

jaw on either side. (The so-called "dental groove," which is supposed to result from this process, is a very incorrect and misleading term, as many a reader who attempts to study Goodsir and his school will learn. An indentation or depression is made in the underlying mesoblastic tissue which, if the layer of epiblastic tissue be removed, will be seen as an open groove in the mesoblastic tissue beneath (Fig. 9). However, the application or use

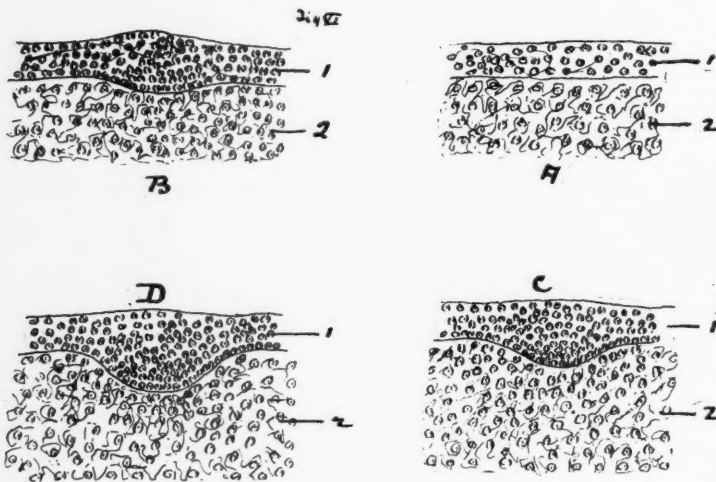


Figure 6. The formation of the "tooth band." (Diagrammatic). (1) Epiblast. (2) Mesoblast.

of the word "groove" to the normal condition and natural position of the tissues can only be mystifying and misleading.)

About the 48th day, i. e., about one week after the first indipping which led to the formation of the tooth band, the entire band seems to stop its downward (i. e., inward) development, while at the base of the band at ten different points around the embryonic maxilla, separated by intervals which are to mark the future dimensions of the interalveolar processes (in embryo), the epiblastic cells continue to push on inward in the form of tubular papillæ, forming ten indentations in the underlying mesoblastic tissue, and constituting themselves as the budding epiblastic cords

of the enamel organs of the ten lower deciduous teeth. Figure 10 is a cross section through the entire head in the region of the incisors, showing the enamel buds or papillæ of four incisors

FIGURE VII.

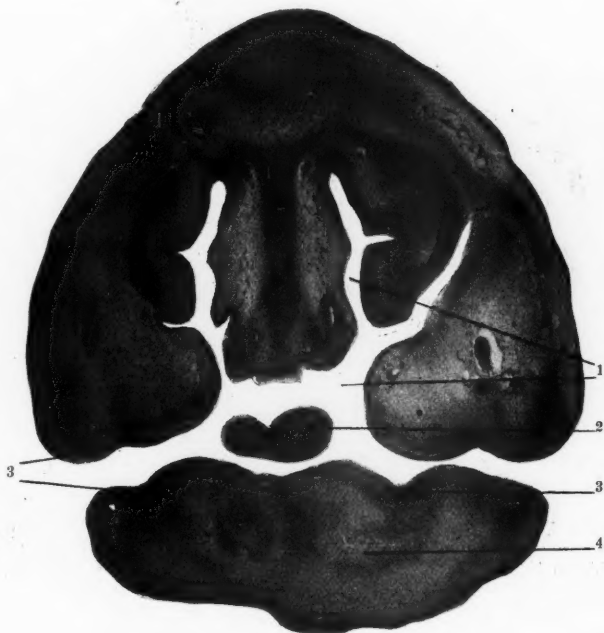


Figure 7. Cross section through the head of an embryo between six and seven weeks old, showing the first infolding of the epiblast in the formation of the "tooth band." (1) Oro-nasal cavity. (2) Tongue. (3) Tooth band of the upper and lower jaw. (4) Mesoblastic tissue of the lower jaw.

(upper and lower jaw on either side) in place, while Fig. 11 is a cross section of a single ramus of the same lower jaw, showing one of these developing papillæ of the same stage. Under still higher powers of magnification the same enamel organ (Fig 12) will be seen to be differentiating into two layers, the beginning of the stratum malpighii and stellate reticulum, corresponding to

a similar differentiation which is taking place in the epiblastic tissue at the surface.

FIGURE VIII.

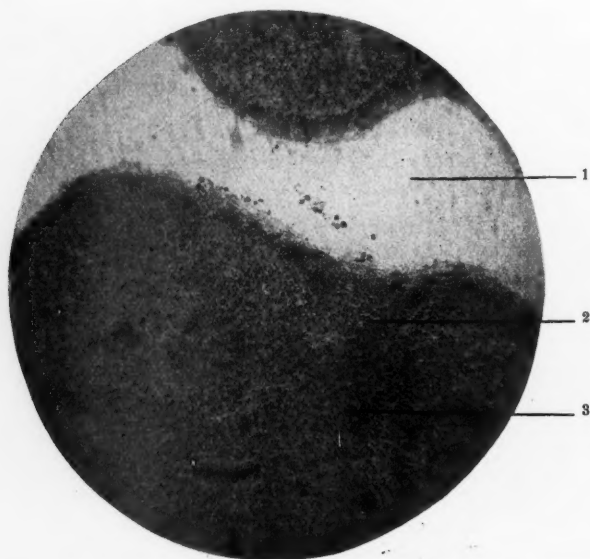


Figure 8. Cross section through head of embryo, showing the first stage in the formation of the "tooth band." (High magnification.) (1) Oral cavity. (2) Tooth band (epiblastic). (3) Mesoblastic tissue of the lower jaw.

Fig IX

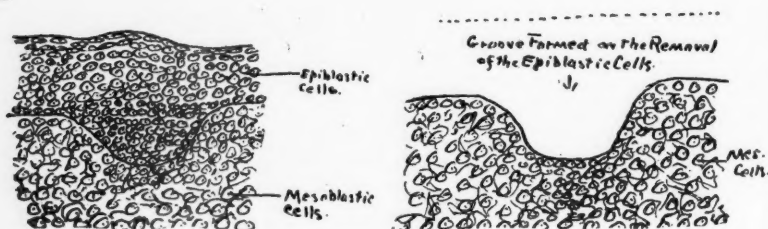


Figure 9. Diagrammatic representation of the so-called "dental groove" of Goodsir.

As the enamel organ continues to push on inward it at first becomes pear-shaped and then slightly flattened at its base (Fig.

FIGURE X.

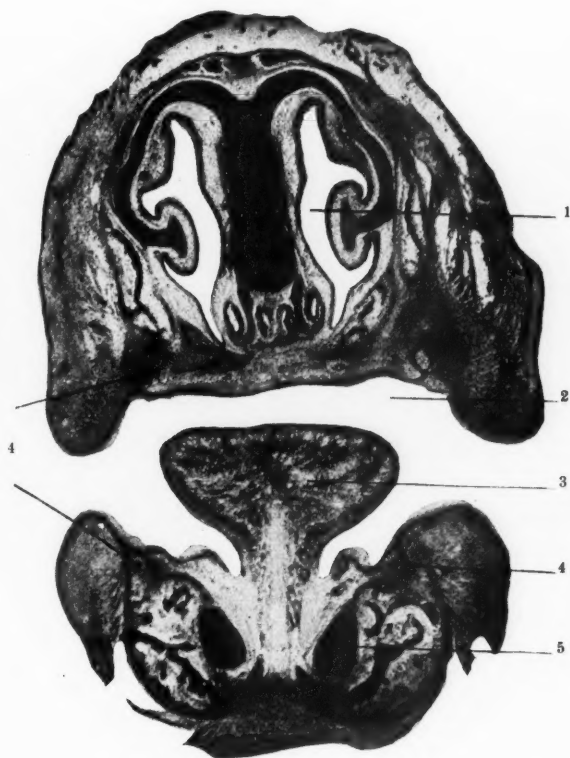


Figure 10. Cross section through head of embryo to show the general relation of the developing teeth to the rest of the head; showing two enamel organs on either side, upper and lower jaw. (1) Nasal cavity. (2) Oral cavity. (3) Tongue. (4) Enamel organs. (5) Meckel's cartilage.

13). The enlarged or more expanded condition of the lower portion or body of the papillæ, as compared with the narrower neck or cord, results from the more rapid growth and multipli-

cation of the cells at this point. The increased activity is due to their closer relation to the source of cell pabulum, *i. e.*, the mesoblastic tissue. [Note.—The source of cell pabulum or cell nutri-

FIGURE XI.



Figure 11. Same stage as Figure 10, showing the general relation of the developing enamel organ to a single ramus of the lower jaw. (1) Epiblastic tissue lining the oral cavity. (2) Developing enamel organ. (3) Meckel's cartilage. (4) Developing bone.

tion is of course the blood, and the entire vascular system is mesoblastic in origin, *i. e.*, the heart, blood vessels, blood corpuscles and the blood are mesoblastic structures, each separate part of the circular system developing from the mesoblastic tissue in the

region which it is to occupy in its fully developed condition. For example, the inferior dental vessels develop in their own peculiar anatomical position, and the blood vessels of the pulp develop from the mesoblastic tissue in the region to be occupied by the future pulp of the tooth. It is important for us to remember in connec-

FIGURE XII.

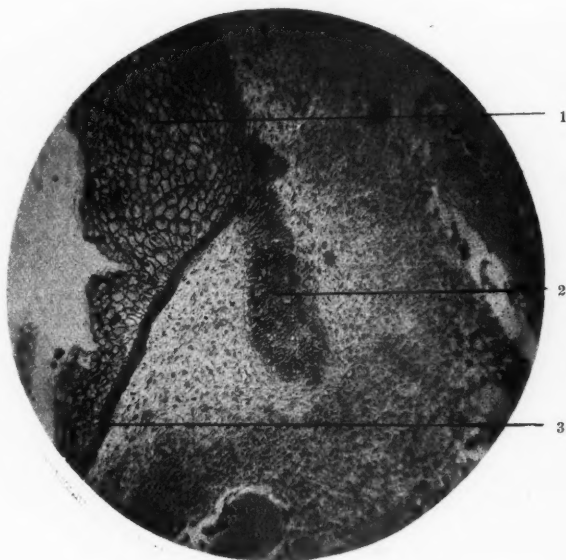


Figure 12. Same as Figures 10 and 11, showing the minute structure of the enamel organ at this stage. (1) Epiblastic tissue lining the oral cavity. (2) Enamel organ, showing the beginning of the differentiation into the stratum malpighii and stratum reticulum. (3) Stratum malpighii.

tion with the calcification of enamel that the entire vascular system is *mesoblastic* in origin and never *epiblastic*, and the enamel organ, being epiblastic in origin, has therefore no blood supply, and it must obtain its calcium salts, which of course come from the blood, from some mesoblastic tissue. It will be seen later that the dental sacculus, which is a mesoblastic tissue and therefore richly supplied with blood vessels, lies immediately external to and

in contact with the stellate reticulum of the enamel organ and is the means from which the enamel organ obtains its calcium salts in the process of calcification. The dentin and cement organs, on the other hand, being mesoblastic in origin, are richly supplied with blood vessels and therefore furnish their own calcium salts.] The neck, on the other hand, becomes continually narrower and

FIGURE XIII.

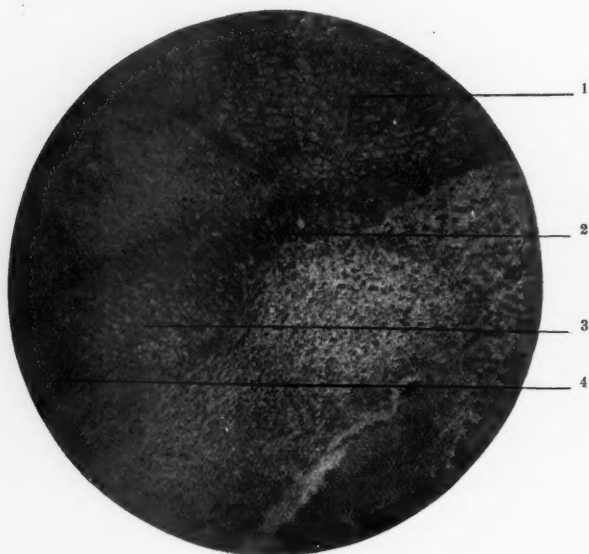


Figure 13. Showing the slight flattening at the base of the enamel organs marking the first sign of the appearance of the dentin germ. (1) Surface epiblastic tissue. (2) Neck of the enamel organ. (3) Enamel organ. (4) Region of future dentin germ.

narrower, due to the failure of its cells to keep pace with the more rapidly developing cells of the papillæ proper, and the pear-shaped appearance is the result.

It is about this time that the first change is noticed in the mesoblastic tissue beneath the developing papillæ. The hitherto apparently dormant and loosely packed mesoblastic tissue seems to have reached its limit of compression, caused by the downward

growth of the now pear-shaped enamel papillæ, and as the papilla continues to push on inward it seems to meet with some obstruction at its lower central portion, the obstruction resulting from a change which has taken place in the mesoblastic cells at this point and which is the first step in the formation of the dentin germ.

The lower central cells of the enamel papillæ cease their down-

FIGURE XIV.



Figure 14. Cross section through a single ramus of the lower jaw, showing the developing enamel organ and first appearance of the developing dentin germ. (1) Surface epithelium lining the oral cavity. (2) Enamel organ. (3) Meckel's cartilage. (4) Developing bone. (5) Dentin germ.

ward growth, and the base of the papillæ becomes at first flattened (Fig. 13 A), but the marginal or peripheral cells, continuing to push on downward and inward past and around the obstruction, the papilla has the appearance of becoming indented at its lowest central portion, as would a hollow rubber ball. Figure 14, low power, shows the relation of this condition to the rest of the jaw,

while Fig. 15 shows the same condition under high power, the condensed mesoblastic cells of the forming dentin germ being plainly visible. The greater increase in size of the body of the papillæ as compared with the neck or cord is also shown in this plate.

The periphery of the enamel organ, first capping the condensed

FIGURE XV.

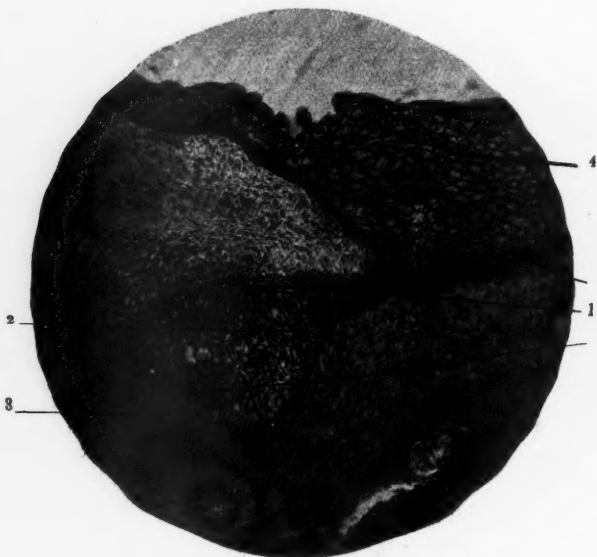


Figure 15. Same stage as Figure 14, under high magnification. (1) Stratum malpighii of the enamel organ. (2) Stellate reticulum of the enamel organ. (3) Dentin germ. (4) Surface epithelium.

mesoblastic cells (Fig. 16 showing its relation at this time to the rest of the head, Fig. 17 showing its relation to a single ramus of the lower jaw), then overlapping the dentin germ (Fig. 18, low power; Fig. 19, high power) it continues to fold down over its sides (Fig. 20, high power).

At the same time that these changes have been taking place in the enamel organ the forming dental papilla, developing upwards,

seems to have concentrated its entire force at the lower central portion of the enamel organ, forcing it upwards almost to its point of inception (Fig. 21, low power; Fig. 22, high power), the two combined processes, i. e., the downward development of the enamel organ and the upward development of the dentin

FIGURE XVI.

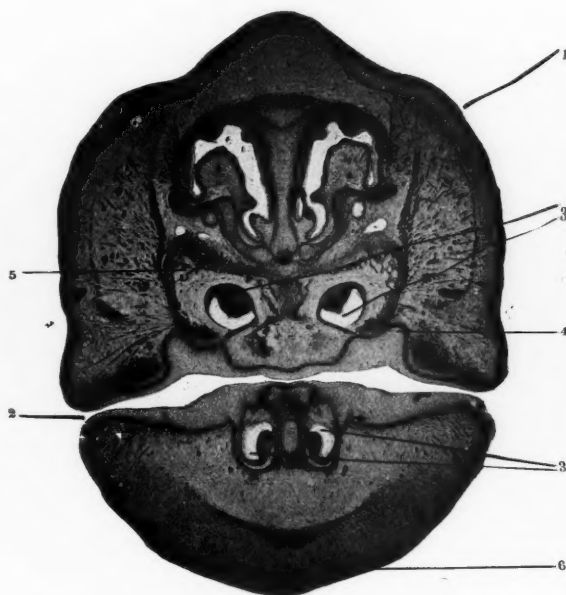


Figure 16. Cross section through head of embryo, showing general relation of the developing teeth germs to the rest of the head at this stage. (1) Nasal cavity. (2) Oral cavity. (3) Developing tooth germ of the upper and lower jaws. (4) Future lip furrow. (5) Developing bone of the superior maxilla. (6) Developing sweat glands.

germ, resulting finally in their perfect mutual apposition. Figure 22 shows the mutual apposition of the two germs, one to the other, almost complete, while in Fig. 23 the dentin germ is seen to be entirely enclosed by the enamel cap. [Note.—Regarding the nature of the union occurring between the enamel organ and

the dentin germ, Dr. Sudduth says: "There occurs no relation between the two, other than that of perfect adaptation. Vessels and nerves have never been demonstrated as passing from one to the other. The relation is analogous to that sustained by the

FIGURE XVII.



Figure 17. Cross section through single ramus of the lower jaw at a little later stage than that shown in Figure 16. (1) Surface epithelium. (2) Stellate reticulum of the enamel organ. (3) Dentin germ. (4) First appearance of the dental sacculus. (5) Meckel's cartilage. (6) Developing bone.

epiblastic and mesoblastic (*i. e.*, epithelial and connective) tissues of the oral cavity from which they respectively take their origin, and as there is no distinct union between the origins of the two tissues, so, too, there can be no union between their products.

The (future) enamel cap can (therefore) be very easily lifted off the dentin cone—the two separating very readily at their line of union.”]

By this time the enamel organ will be seen to have differentiated into its three different layers, i. e., the stratum malpighii, stratum

FIGURE XVIII.

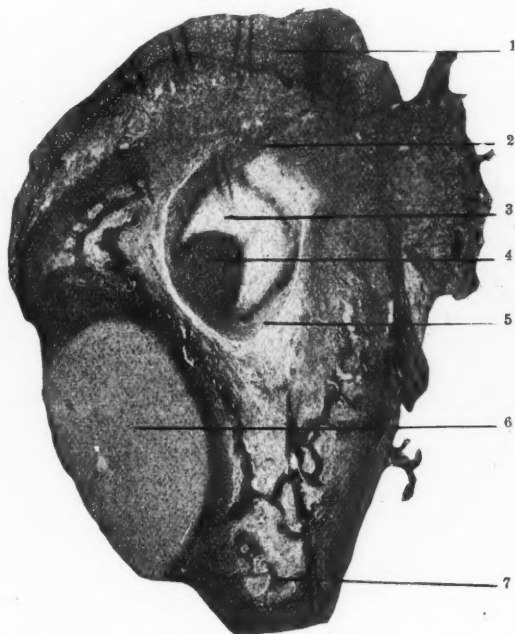


Figure 18. Cross section through a single ramus of the lower jaw, showing the general relation of the developing tooth to the rest of the jaw. (1) Surface epithelium. (2) Enamel cord. (3) Enamel organ. (4) Dentin germ. (5) Dental sacculus. (6) Meckel's cartilage. (7) Bone.

intermedium, and the stellate reticulum. The stratum malpighii, the deepest or most internal layer of the oral epithelium proper, and which became *external* in the *pear-shaped* stage of the enamel organ, has, as a result of the formation of the dentin germ, *again become internal*, and is now the portion of the enamel organ proper which lies in contact with the dentin germ. The stellate reticulum

has by this time undergone a considerable change over that seen in Fig. 12. The nuclei of the central cells have become larger and the protoplasm has increased in quantity, extending laterally and driving the cell membrane before it, and these enlarged cells have gradually transmitted their force inward until they reach almost to the stratum malpighii, leaving but a single layer of the unaltered

FIGURE XIX.

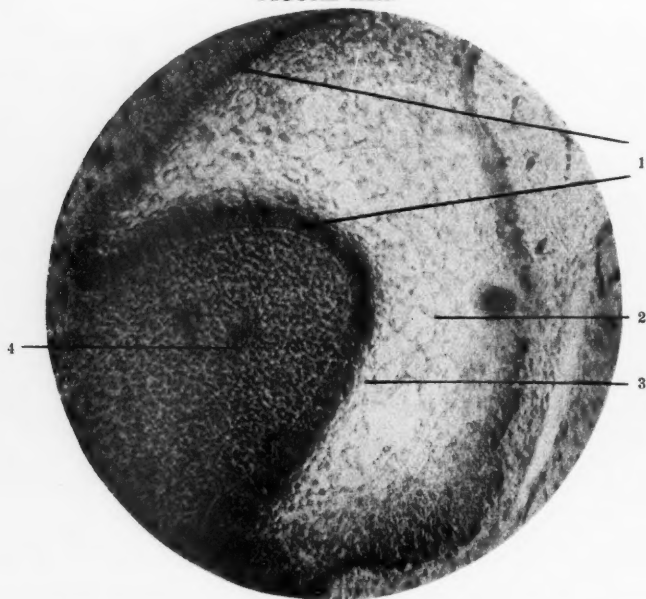


Figure 19. Same as Figure 18, showing the developing tooth under high magnification. (1) Stratum malpighii. (2) Stellate reticulum. (3) Stratum intermedium. (4) Mesoblastic cells of the dentin germ.

original stellate reticulum lying immediately adjacent to the stratum malpighii, and in future to be known as the stratum intermedium. The altered cells of the stellate reticulum have now "taken on a peculiar meshy appearance, the cell membrane taking on a pseudo canal-like arrangement, and continuing to spread, lose all resemblance to epithelial cells until in their winding in among one another the cells, being connected by means of long narrow

protoplasmic bridges, assume a starlike reticulated appearance, with their nuclei seemingly standing alone, apparently unenveloped by any definite cell wall, the thin protoplasmic fluid forming an enamel 'pulp' apparently highly suitable for a rapid circulation of nutrient fluid." (Race.)

So that we now have three kinds of epithelial cells in the enamel

FIGURE XX.

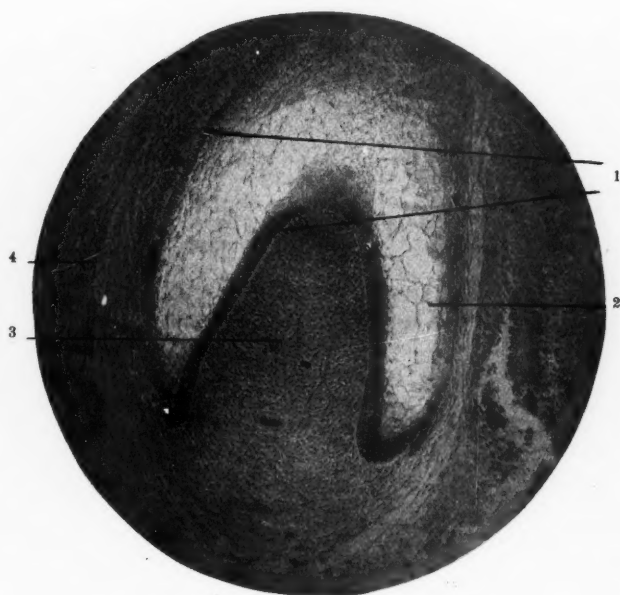


Figure 20. The developing tooth at a little later stage than is shown in the previous figure. (High magnification.) (1) Stratum malpighii. (2) Stellate reticulum. (3) Dentin germ. (4) Dental sacculus.

organ; most internally the stratum malpighii, which immediately covers the dentin germ; external to the stratum malpighii being the stratum intermedium, and still more externally is the stellate reticulum.

The dentin germ is now also completely formed as described above (Fig. 1). The original small round mesoblastic cells have

undergone a considerable change. Those lying most externally have formed into a single row of tall columnar-shaped cells, arranged in a single layer immediately beneath the stratum malpighii of the enamel organ, and completely surrounding the dentin germ.

FIGURE XXI.

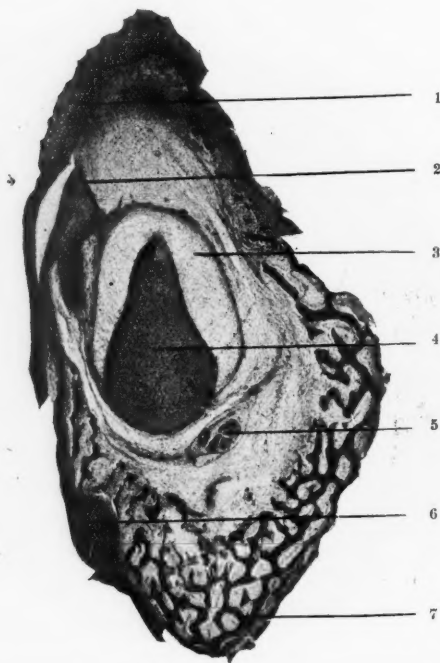


Figure 21. Showing the general relation of the developing tooth to the rest of the lower jaw. (Low power.) (1) Surface epithelium. (2) Enamel cord. (3) Enamel organ. (4) Dentin germ. (5) Inferior dental vessels and nerves. (6) Meckel's cartilage. (7) Developing bone.

(Each of the cells of the odontoblastic layer is said to give off three sets of fibers, one externally beneath the enamel organ, one internally into the body of the dentin germ, and one laterally by means of which the different odontoblasts are connected with each other.) Immediately internal to the odontoblastic layer is a layer

of somewhat pear-shaped or "*goblet cells*," less highly differentiated than the odontoblastic layer, but still more highly developed

FIGURE XXII.

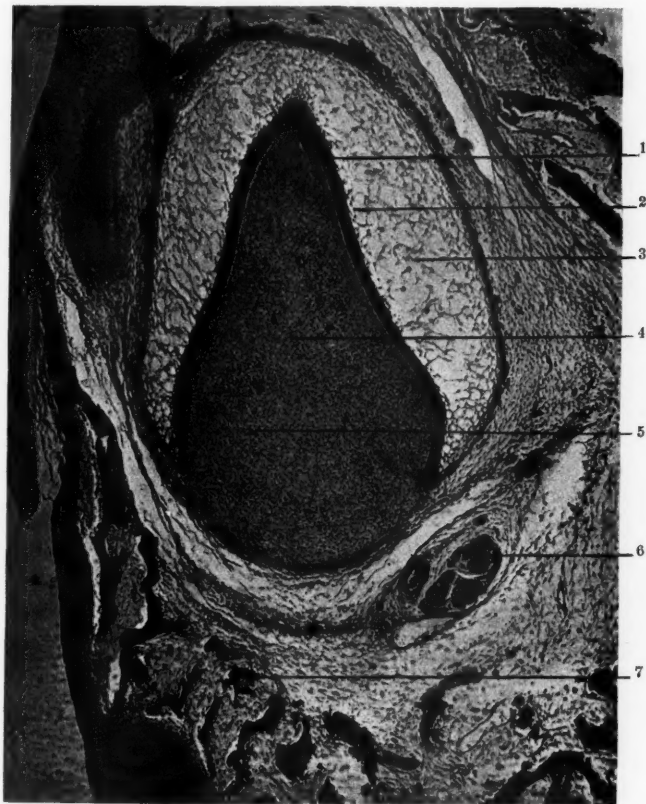


Figure 22. Showing the developing tooth at this stage under high magnification. (1) Stratum malpighii. (2) Stratum intermedium. (3) Stellate reticulum. (4) Undifferentiated mesoblastic cells of the dentin germ. (5) Blood islands of the pulp. (6) Inferior dental vessels and nerves. (7) Developing bone of inferior maxilla.

than the original mesodermic cells. Internal to these *goblet cells* lies the great mass or body of the dentin germ, which is made up

of the original small round mesoblastic cells, undifferentiated except for the occasional presence of masses of small round blood

FIGURE XXIII.

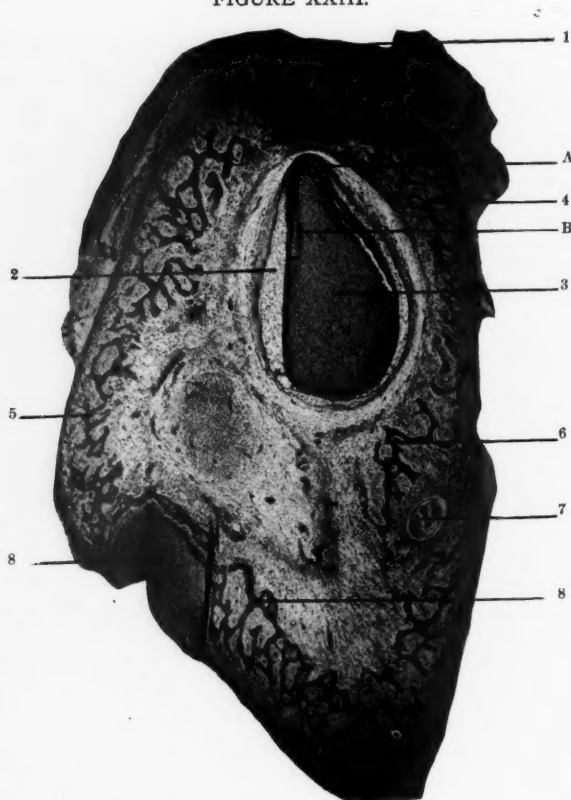


Figure 23. Showing the dental follicle fully formed and its general relation to the rest of the jaw. (1) Surface epithelium. (2) Stellate reticulum of the enamel organ. (3) Dentin germ. (4) Alveolar process. (5) Developing bone. (6) Bone forming the inferior dental canal. (7) Inferior dental vessels and nerves. (8) Meckel's cartilage.

cells known as blood islands, and from which the blood vessels of the pulp are forming.

(To be concluded.)

THE INTEREST OF THE DENTIST VERSUS THE
INTEREST OF THE PUBLIC.

BY RENÉ ANEMA, TANDMEESTER, D. D. S., THE NETHERLANDS. READ
BEFORE THE PENNSYLVANIA STATE DENTAL SOCIETY, AT
WILKESBARRE, JULY 12-14, 1904.

Upon receiving the kind invitation to read a paper before your society, I felt much pleased and gladly accepted it, because I know there are among you men who are more learned and better able than I am to give some valuable suggestions upon a subject in which I am much interested, namely, "The Interest of the Dentist Versus the Interest of the Public." The main feature, which makes the title less arbitrary than you at first might suppose, and of which I am going to present you a study, is professional egotism. I say study purposely to let you know that my paper, instead of being a well-designed and nicely-framed picture, is merely a sketch.

Problems such as we are going to consider here may be called in some ways sociological problems. In trying to resolve such questions it seems next to impossible to leave out the mental factors called moralizing and preaching as well as the fiercer one of condemning. These factors are dangerous friends when we earnestly wish to probe a sociological question to its bottom. In endeavoring to come as near to the truth as possible, let us therefore leave those three passionate friends at home and look upon things as the German philosopher, Nietzsche, would do—from a point on the other side of good and evil.

I am unable to give you a synthesis of professional egotism, by which you might see at once its whole spiritual body with its clear outlines and distinct limits. The method I shall follow is the one of analysis and the study of symptoms as I see them or mean to see them. Perhaps it is unnecessary to say that this way of treating the subject will occasionally show a hiatus on the road on which the essayist leads you, or, in other words, will occasionally give the essay a somewhat incoherent character.

In my language, that of the Netherlands, there are two words for your one word "profession," both being almost equally com-

mon in use. The one gives the concrete signification of profession, meaning the number or class of men that practises the same art; the other gives the abstract signification and means vocation or calling. With these two words in mind it is easier to make oneself understood than with one. The concrete word class for dental profession is a rather unfamiliar word in American society, because class differences are not as distinct as in older countries. When one keeps in mind only the abstract signification of profession, professional egotism is a *contradictio in terminis*, but when one thinks of the concrete the new term becomes more familiar.

To my mind there is no more doubt of the existence of professional egotism than there is of a certain kind of patriotism, called jingoism, that preaches, "My country, right or wrong," or of that egotism which by instinct and brute force extinguishes weaker races. Of the latter we have in the history of mankind many instances. Of the former I hope to give you an example later on. All these forms of egotism are brought about by instincts of the individual becoming active in the mass at certain times and intervals of its existence.

In seeking the genesis of professional egotism, allow me to tell you first something of the instinct of self-preservation and of what I call self-preservation of the class. In our day, when learning and civilization are overestimated, perhaps it needs some courage to declare that a dentist is also an ordinary human being, with instincts giving active power to his mind and body. One of your best authors says that of all animals man has the most instincts.

Among the strongest instincts of man is the one of self-preservation. It is a common truth that instincts are hard to deal with, if, indeed, they can be dealt with at all. They may become concealed to the inexperienced eye, covered by a so-called civilization which oftentimes is nothing but a social veneer, or by an amiable self-deceit of good people which makes them believe that at least among the higher classes instincts, and also the one of self-preservation, are rudimentary. If, however, these less critical people believe that the higher classes look out merely for the interests of others, they are mistaken. The lesson given nearly two thousand years ago, "Love thy neighbor as thyself," is still generally applicable, which means that man as a rule loves himself more

than his neighbor and more than any other man. His instinct of self-preservation dominates his altruistic feelings. I will not say, however, that there are no such people as martyrs, in whom the instinct of self-preservation seems almost lost, but this specimen is very rare.

When a man joins his profession he brings his instinct of self-preservation with him. It brings him often in closer contact with the profession, as he hopes that the profession may at some time be of use to him. Notwithstanding man's idealistic feelings and the almost overwhelming influence of them, as can be the case after a long solitary contemplation, or transferring thoughts to others in enthusiastic gatherings, it cannot be denied that the average professional man not only possesses this instinct of self-preservation, but that he needs it wherewith to earn his daily bread.

When we take the dental profession as a class, each man making a living through dentistry, to protect himself and his family from starvation, should it be at all surprising that there exists such a thing as self-preservation in this class? Again, our professional family may be compared with the still larger family of nation or race, in which the instinct of self-preservation is always present, being awake and active in times of rude competition called war, but dormant at times when no attacks are to be feared.

The following, I think, is an example of professional self-preservation: In a certain country a society of dentists, forming the editorial staff of a dental journal, desired to change the rules. One of the members proposed the following as the principle on which the new structure should be erected: "The society intends to serve the public by promoting dentistry, dentistry in the most remote sense of art and science." His obvious reason, as he explained at the time, was to have as the leading motive the "interest of the public." After having been carefully considered, the proposition was rejected almost unanimously.

So far as the thoughts of the opposition could be understood, the men who voted against the public interest proposition, feeling themselves representatives of their profession, considered it their duty not to look out—at least, not in the first place—for interests other than those of the body of men represented. The new rules were now

based on a foundation which can easily be laid bare and understood by looking upon the flag and emblem of one of our best dental journals which says, "Devoted to the interests of the profession."

As dental journals are leaders and at the same time the voice of the profession, I consider these two facts as very valuable and as a proof that the dental profession needs devotion to its own interests. Also, as devotion to one (the profession) excludes devotion to another (the public)—otherwise it is no devotion—what else can be the cause for the demand of this highest form of affection than the instinctive self-preservation of the class? But as an instinct acts unconsciously, its action may not be generally observed, and therefore my conclusion, that we have in these two journals also two instances of self-preservation of the class, may not be generally accepted.

Judging from these cases and comparing them with similar ones in other countries, I think I am right in saying that the dental profession, as all young bodies, has a strong instinct of self-preservation and at the same time is limited in its motive power, handicapped as it is on its way to the general ideal by its class instinct: "The interest of the profession."

After this I may give you at once my definition of professional egotism as the *active self-preservation of the class*. This potent inner prompting becomes fully awake and highly active in times and places where attacks are to be feared by competition, in the same way as wars are brought about by collision of the interests of nations.

Here follows an instance of professional egotism: In a certain country a body of over 250 dentists use their power to prosecute respectable foreign dentists for using legally acquired but foreign degrees of doctor. As their country does not furnish a dental doctor degree, the dentists claim that the foreigners gain an undue reputation by the use of that title, thus doing harm to the interests of the local dentists.

Here I might have finished my study on the subject, but I feel still somewhat in debt to the last part, "the interest of the public." If it is true that the profession as a body is limited in its

motive power (being devoted to its own interests), an interesting question to treat, especially from the public point of view, is: Who looks out for the interests of the public in the case of dental legislation? Dental legislation, according to some, exists to protect the public from malpractice, and according to the same authorities it is necessary for that purpose.

However, it cannot be according to this principle that a law is made which debars a foreigner from practicing his art, no matter from which reputable school he comes or how many years of reputable practice he may have had, but compels him to pass through all the preliminary examinations and to spend at least two years in the local dental school, after which he must pass the dental examinations, and yet there is such a condition in France.

What shall we think of the legislation of many of the American states, as cited by Dr. Kirk in his paper on "The Unification of Dental Legislation," when he says, "Much of our dental legislation owes its existence to the effort of those who make the protection of the dental practitioner against the competition of his unqualified neighbor their primary and leading motive?" What also must we think of the professional legislation of Austria, Belgium and Italy, where only medical men are allowed to practice dentistry, and that, too, without the necessity of passing any dental examination at all?

When all the European countries give their physicians a right to practice dentistry, do you think that this legislation is made in the interests of the public, or merely to satisfy a class that at the time has the most influence upon the legislature? The leading motive in all these cases may have been protection of the public from malpractice, but if it was, in my opinion the object has not been gained.

It may surprise some of you to know that in Germany the healing art is free. Everyone who likes may practise medicine and also dentistry. It has long been an open question to me why this should be, but in looking back upon many a professional legislation, perhaps we may come to the conclusion that Germany is not so wrong after all. Anyway, we know that Germans are a thorough race and think a long time before they act. Is it merely

accidental that in Germany the philosophical thought originated that the main desire in man was the desire for power?

At the end I apologize for what moralizing I have done. Notwithstanding that I have endeavored to hold back my friends, the preacher and the condemner, I know that I have not fully succeeded. Now, when I am free again, I hope you will allow me a few moralizing remarks. That I have not spoken more for the "interest of the dentist" I hope will not be a reason for accusing me of criminal neglect, as there is to my mind sufficient proof that the dentist can look out for his own interests. Still, I fear that some of you will condemn me for talking so much of professional egotism and for exposing the profession as I have done, and, as I dislike to be censured, I promise that at some future time I will write a longer essay on "professional altruism," in that way turning my critics into friends. Because, with Plato, I am a firm believer in the absolute good, a spirit which is also largely represented in our profession.

DISCUSSION. *Dr. W. F. Litch, Philadelphia:* The fundamental idea in this philosophical paper appears to be that dentists in seeking to secure legislative measures regulating the practice of dentistry are not entirely altruistic. That is unquestionably and necessarily true in this country at least. Here a great deal of stress is laid upon the welfare of the "dear public." Suppose this society appoints a committee to apply to the legislature for an amendment to the present dental law or for a new law, and that committee frankly tells the law-makers that such legislation is not wanted because unqualified men are practising dentistry to the injury of the public, but is wanted for our own protection against competition in a vocation for which we have spent much time and money in preparing ourselves, while outsiders without any preparation are interfering with our professional work—do you think that committee would succeed? The position it should take is that the irregular practitioner has not the qualifications we possess and is injuring the public, which should be protected against him. However, both attitudes are perfectly logical and correct, as both the public and the professional man must be protected against the irregular practitioner in any professional pursuit. If we are to maintain high standards of professional education and qualification for the benefit of the

public, which is really the ultimate motive, it is absolutely necessary that the practitioner as well as the public should be protected by proper legislation.

As regards the attitude of Germany with reference to the American degree of D. D. S., it has been sharply criticised as a trades union proposition pure and simple. German dentists know perfectly well that as a rule American dentists are capable practitioners, so here no doubt professional egotism comes into play, as well as a national desire for protection against outside competition. However, America cannot criticise Germany in this respect, because we are certainly wedded to protection in all lines.

Dr. F. D. Gardiner, Philadelphia: I think the essayist has overlooked one of the leading motives responsible for dental legislation, namely, professional pride and self-respect. The educated gentleman of high professional attainments certainly suffers much in public esteem as well as in his own self-respect by being classed by the public with those who are in every way his inferiors and for whom he entertains a just contempt. The general elevation of the profession to an increasingly higher plane I believe to be the leading motive with many of us for demanding and supporting legislation, and no more worthy motive need be sought. I seriously doubt whether competition alone would have placed many dental laws on the statute books or would have enforced those which were there. Perhaps competition is a potent reason with some who aid in enforcing the law, but in our own state at least those who are most active in this regard are the ones farthest removed from the effects of the competition of the unqualified. It is almost impossible for the American dental mind to discover any worthy motive for the larger share of European dental legislation and restriction. It does not seem to be of a character to protect the public, and the ultimate good of the profession does not appear to be safeguarded. The welfare of the public and the elevation of the profession, together with the fixing of a uniform standard of education, are the only reasons which have appealed to me for dental legislation and its enforcement, and that wise laws discreetly and efficiently enforced do accomplish these results is beyond question.

Dr. Joseph Head, Philadelphia: The German people take such care to safeguard the public in other respects by adequate laws that it seems strange they should allow both medicine and dentistry to

be practised by the skilled and unskilled alike. The question of selfishness in the dental profession is a purely personal one after all with each individual dentist. No doubt in some things we are selfish, and a certain wholesome selfishness is necessary for self-preservation, but when in our dental meetings each one unselfishly gives up his time to help on the work of the sessions, and certain individuals devote most of their lives to working out problems for the general good of the profession, even though there can be no pecuniary reward, I think that by these acts alone we dissipate the idea that as a class we are not impelled by the higher motives of altruism and that our lives are not given up unselfishly to the mitigation of human suffering.

Dr. Anema, closing discussion: To prevent misunderstanding I wish to repeat that my paper was intended to be a study in psychology of the mass of men who practice dentistry, and was not aimed at any particular country. I can't say that I know the whole dental profession, but I know some of it, as I have lived in many foreign countries and have visited dental colleges and societies therein. As regards the vital point of my paper—professional egotism—I gave the essay to a lawyer to read, also to a physician, and they both told me that the same sort of egotism existed in their professions, so dentistry does not hold a unique place. The present law of Germany originated in 1869, when Bismarck was at the height of his power, and was the reaction from the unbearable pressure of innumerable laws, regulations and limitations in favor of certain corporations which we today would call trades unions. At and before that time surgeons also had their associations.

PYORRHEA ALVEOLARIS AND ITS TREATMENT.

BY GORDON WHITE, D.D.S., NASHVILLE, TENN. READ BEFORE THE
PENNSYLVANIA STATE DENTAL SOCIETY, AT WILKESBARRE,

JULY 12-14, 1904.

It is rather embarrassing to appear before you when perhaps I have little that is new to offer. I have been asked to give my treatment for pyorrhea alveolaris. No disease, as you know, has been inflicted with a greater number of names, even as no affection of the mouth is a greater affliction, but I see no good reason for adopting a new name, or of discussing the etiology and pathology of the

disease in this short paper. It is, as the French would say, the "bete noir" of our practice, but it can be practically cured and the affected teeth be made to do their work through the average life. However, I know of no greater risk than to make promises to the habitual toddy-drinker or excessive tobacco-user. My observation is that most gum troubles if neglected lead to pyorrhea, and that any constitutional lesion more or less affects it.

At the first sitting, even before the examination, the mouth is mopped or sprayed with Dioxogen or Pyrozone for cleansing. A general and thorough examination with a smooth instrument is then made of all the teeth affected and treatment begun upon the most important or the most involved. I apply locally and inject into the pockets any one of the reliable local anesthetics, with the effects of which I am familiar, usually a 2 per cent solution of cocain—never a stronger one—and after a few minutes of waiting the deposits are removed with delicate but stiff instruments.

The success of this, the most delicate bit of surgery in the entire field of surgery, is almost wholly dependent upon acuteness of touch, for the thin layer of what is commonly called serumal deposit can rarely be seen, and yet can be scraped to an infinitesimal thinness without being removed, hence the importance of the sense of touch being educated to detect this thin layer, which will assuredly prevent the cure if allowed to remain. I am more indebted, for whatever success I have had, to the acuteness of the sense of touch than to any other factor of the treatment, the opinion of others to the contrary notwithstanding. Do what you may in the treatment, surgically or medicinally, so surely as any of this deposit remains just so surely will the treatment fail.

During the surgery or removal of deposits the patient is permitted at intervals to rinse the mouth thoroughly with an antiseptic wash. Of course teeth which are loose must be fixed in their positions in the way deemed best and bad occlusions corrected. There are several ways of fixing these teeth, either with silk thread, united bands, united crowns, or a spring splint. The latter, which has given great satisfaction, is constructed by swaging a piece of gold plate to the lingual and buccal or palatal and labial surfaces, according to location, and then uniting these plates with spring wire, which when snapped over both sides of the teeth is a most excellent means of securing them and can be easily removed for cleaning. The wire is

of course passed from one plate to the other between the cutting-edge space of the mesial and distal surfaces.

Where there are missing teeth the remaining loose teeth can be made most serviceable by bridges, and it is really astonishing how useful a few isolated loose teeth can be made. All roots of the molar teeth, free from any attachment to their sockets, should be amputated, for the remaining roots if properly treated can be made serviceable for years in the support of crowns and bridges. The bands of these crowns should never be allowed to extend under the gums, for a constant irritation will cause a return of the trouble.

I do not hesitate to remove the pulp from any of the teeth greatly affected and in all cases where there is enough bone remaining to justify an effort to save the tooth. I have rarely known a case that was not benefited by the removal of the pulp and the usefulness of the tooth prolonged. Just why this is I know of no one who knows positively, but most probably it is due to a change in the blood supply to the locality.

After a thorough removal of all deposits the pockets are washed out with Dioxogen or Pyrozone and then with warm water. This is followed by injecting a drop or two of pure lactic acid, to which has been added four drops of formalin to the ounce. As the acid is somewhat painful, being rather escharotic to the soft parts, the shallow pockets are usually swabbed out with a little cotton wrapped on the point of a broken broach, thus keeping so much of the acid from contact with the mucous membrane. Before applying the acid, however, the lips and indeed a considerable area about the mouth are smeared with a little oleostearate of zinc to prevent the acid from burning, for should the lips be burned by contact with the acid it is almost sure to cause what the patient calls a "fever blister" or "cold sore." When the syringe is used rolls of bibulous paper should be so placed about the pockets as to absorb the surplus acid. To counteract the effect of the acid on the mucous surface, nothing is more effective than to rinse the mouth with Milk of Magnesia. The necessary suffering is sufficient to make it desirable to prevent all that is preventable.

Lactic acid was suggested to the profession a number of years ago by that great man in this disease, Dr. W. J. Younger, and up to the present time I have found nothing as a universal remedy to equal it. When the roots are sensitive, however, I have for many years

applied lactate of silver with most gratifying results. It has much the effect of nitrate of silver without apparently so much or so dark a deposit.

The very loose teeth should be disarticulated and placed in a state of rest during the treatment. After the surgical treatment the pockets are not disturbed for a week or ten days, but the officinal tincture of iodine is applied to the gums about every other day, and the patient directed to use some antiseptic mouth wash half a dozen times a day. Should the pockets show no sign of healing it is certain that there is something remaining that should be removed, either a scale of deposit or some foreign substance which has lodged and acts as an irritant, so the surgery is repeated from time to time until the healing occurs.

It is my practice to keep up with each case until the recovery is manifest, for in no other way can the wound be kept free from irritating agents, such as particles of food, etc. I regard it quite as necessary that the dentist should look after his case of pyorrhea after the surgery in the treatment, as it is for the general surgeon to see his cases after operation. As his cases need dressing, just so with our cases of pyorrhea. Absolute cleanliness is necessary. I instruct my patients to thoroughly wash their teeth not less than five times a day—on rising in the morning, after each meal, and just before retiring. I show them how to clean their teeth and strongly urge a clean mouth. Massaging with the fingers is always of the greatest benefit.

As to constitutional treatment, much more depends upon the manner of living than upon the administration of drugs. To quote our beloved Dr. C. N. Peirce—"When I have gotten my patients to drinking water I think I have accomplished much toward the cure of this dreaded gum disease," so one of my most urgent injunctions is to flush the sewers, take an internal bath. The customary diet of white breads, sweets, red meats, etc., should be changed for one of coarse breads made of pure graham flour and country cornmeal, fruits and vegetables, and the habit of deep breathing and exercise in the outdoor air acquired. We know that even the monkey (our ancestor ?) after he becomes domesticated develops in a short while pyorrhea in its severest form. This has also been noticed in other animals which are confined. Occasionally some one of the alkaline agents is prescribed with more or less favorable results, especially

in cases where there are no deposits and pronounced uric acid conditions.

DISCUSSION. *Dr. H. C. Register*, Philadelphia: As I have watched pyorrhea alveolaris clinically it has impressed me as being both local and constitutional in character, but I believe the active exciting cause to be local. I do not think we would ever have a case of pyorrhea focalizing itself upon the roots of the teeth from the influence of constitutional disorders alone, but in connection with the focalization of the environment of the mouth, which has grown in this age to be a very dangerous one, we have constantly septic and traumatic conditions that lead to infection. These conditions attack the crowns of the teeth and other parts of their anatomy. According to physiologists, in man's degeneracy the mind becomes enlarged at the expense of the physical organization. In the course of time an organ for which there is no use becomes dwarfed and is probably ultimately obliterated. When man walked on four legs he needed his appendix, but now that he walks on two legs it is not essential. The walking erect and the change of food are causing it to atrophy before obliteration. Much the same thing may be said with regard to the teeth, as today they are changing simply because man can live without them. To our prehistoric forefathers teeth were an essential part of the anatomy, but we can do without the mechanical action that was once necessary because our food relations are being changed by a higher civilized life. Furthermore, the economic relations that go to make up the nutritive conditions of man's life are made through concentrated forms that require no mastication. Take sugar, for instance, which is a concentrated carbohydrate and one of the essentials of life. The world consumed 10,000,000 tons of sugar last year, but all the sugar prehistoric man had came from starchy matter and was quite sufficient to supply all his needs. This principle applies generally to food.

As regards the mouth, we have excretory products in the way of salivary calcic matter which has nothing to do with mastication, insalivation or digestion—it is effete matter thrown off by nature to be gotten rid of just as other similar matter through the system. Calculus was not collected to the same extent when people lived differently, their functional tooth, gum and systemic conditions presenting a less difficult problem because of a more simple life. Salivary calculus on the teeth was first observed in 1635 in Holland,

and bacteria were discovered associated with it in the mouth. I have no doubt that the Dutch were afflicted with pyorrhea to some extent at that early date, but I doubt if the aborigines of this country were. Calcic matter comes into the mouth held in solution in the saliva. It has an affinity for tooth attachment by sedimentation just as we have sedimentation of calcic matter in the bladder, or as in ranula, where it is collected in the salivary ducts. In all stages of pyorrhea, from a simple gingivitis up to the pus-producing condition, it is associated with calculus and bacterial toxins, and, like operations for similar deposits elsewhere, the first treatment must be the mechanical removal of the local source of irritation. If you can absolutely remove the calcic matter and preserve the cementum you can cure pyorrhea. Irritation around the necks of the teeth in the form of salivary calculus or food deposit at the gingival border is the forerunner of a simple gingivitis which may become interstitial and may be associated with caries of the cementum, a condition produced by traumatism associated with bacterial infection. The cementum is dissolved out, and this may be phagedenic in character or the disease may run into a condition creating inflammation, thereby calling on the leucocytes of the blood to come to its rescue and try to stay the progress of the disease—consequently we have pus or true pyorrhea. The pericementum is a double membrane connecting the cementum with the alveolar process. When you have breaks at the gingival margin they may be the first incentive of all future troubles of tooth root pathology. It must be remembered that an autointoxication can arise from mouth infection and systemically withdraw the vital force in terminal nutrition so as to allow the local infection full swing.

The treatment for pyorrhea must be radical. If any loose teeth present are capable of conservation they must first be fixed with splints before operating and should be made as aseptic as possible. I have never used the collar or crown that Dr. White mentions, but always make my splints to drop directly into the tooth crown in the form of a bar. I never hesitate to extirpate the pulp when necessary, but as regards teeth being universally benefited by removal of the pulp, I cannot say that I have found it so in my experience. Where you want to conserve the pulp it is very easy to drop a three-cornered wire into a groove and use alloy for fixation, and the teeth soon become firm in the jaw in that way. Do not use gold for any esthetic

reason, as alloy is the only material indicated as a rule in these operations. After the splint is permanently fixed the root tissues should be relieved of all calcic and other irritating matter. I emphasize Dr. White's advocacy of small instruments. Have them made in very thin blades, chisels, that give you the thrust cut and draw cut. Occasionally a bur may be called for, but not often. I prefer sulphuric to lactic acid, as the latter has a great affinity for tooth tissue as well as for calcic matter. It has more affinity for living tissue and not so strong a dissolving power on diseased bone as sulphuric acid, nor is it so good a germicide. It is not only calcic matter and necrosed bone that you are treating, but the whole area is simply filled with vigorous, quick-growing bacteria that are very difficult to get rid of. A fifty per cent solution of sulphuric acid will in most cases dissolve out the bone that is diseased and cannot be removed by instrumentation, and at the same time will kill the germs.

In the treatment of this disease I have found nothing so helpful as atomization under compressed air, and every man should use it in his practice. Air under fifty or sixty pounds pressure will lift out the loose contents of all these pockets. I want to compare the possible results under atomization with the way people are cleaning their teeth today. As a rule mouths are not healthy and hygienic, so we should never undertake to perform any operation without first sterilizing the mouth. I have several patients suffering from pyorrhea who have not been able to procure a proper atomizing outfit, as it is rather expensive, so they take an atomizing treatment for ten minutes at least once a week.

I consider that pyorrhea has three stages—primary, simple gingivitis; secondary, interstitial and phagedenic gingivitis, and third, pus-producing. It never becomes true pyorrhea until it is a pus-producing disease. That comes about because it has progressed until taken up by the circulation, and the functions being destroyed nature cannot demarcate—cannot form a new line of cure, and the result is that the white leucocytes which come to ward off the invasion have a skirmish with the bacteria, and being devitalized they break down and in connection with other material form pus. As I understand it, a dead white leucocyte is a pus corpuscle and you cannot get it in any other way.

As regards the chewing of tobacco, I hardly agree with Dr. White

that it has any influence in bringing about a local or general tendency to pyorrhea, as tobacco is germicidal whether chewed or smoked. In a very pretty experiment Dr. Miller produced the artificial smoking of a cigar so that the smoke was blown through a test tube containing cultures of bacteria, and in a very few minutes the smoke invariably killed all of the germs. Dr. Miller believes that tobacco is more or less germicidal, but of course smoking is of such a character that the smoke cannot reach all the pockets and spaces between the teeth by being simply held in the mouth. If you take a mouthful of any liquid and use the cheeks as bellows you may get an idea that you are forcing the liquid into every possible space, but you are not.

If you will paint with commercial tincture of iodine a set of teeth that looks absolutely clean you will stain the tooth surface and thus bring it under observation, for it must be remembered that these microscopic vegetable growths are colorless—they have no chlorophyll or coloring matter as found in vegetation generally and are just the opposite of vegetable matter as we recognize it. Vegetable matter exhales oxygen and takes in carbonic acid, but bacteria that have no chlorophyll live upon oxygen just the same as human beings do. After allowing the iodine to dry a moment you can show everything up and you will be surprised to see the accumulation upon the teeth. Remember, bacteria operating on the teeth are external, according to Dr. Miller, and according to Dr. Williams bacteria must focalize themselves before becoming operative. In this connection I consider that we have in the commencement of pyorrhea the same exciting cause from mouth environment that brings on gingivitis as we have in focalization of bacteria in producing caries on the crowns of the teeth.

Dr. P. B. McCullough, Philadelphia: Accepting pyorrhea as a local manifestation of a systemic condition, which it is generally acknowledged to be, it follows that the local condition is favorable to its presence in that place, and if we remove the causes that make possible this manifestation we have cured the disease from a dental standpoint. Undoubtedly the careful and absolute mechanical removal of all deposits is necessary first of all, and after that thorough sterilization and proper home treatment. During the last few years I have observed several cases where the mouth conditions appeared to be those of pyorrhea, and yet they were not of uric acid diathesis. In several of these the trouble entirely

disappeared when the use of some particular powder or mouth wash was discontinued. I usually prescribe a suitable wash, the use of precipitated chalk, and the occasional use of salt as a tooth powder. The last named acts on the teeth very much as a Turkish towel does on the body.

Dr. Joseph Head, Philadelphia: Dr. White spoke of the advisability of destroying the pulps whenever they seemed at all involved. Up to three years ago I had that principle well grounded in my mind and practiced it, but at that time I experimented with two bicuspid in a bad case of pyorrhea where both teeth were very deeply involved. I removed one pulp with antiseptic precaution, treated and filled the canal, and there was no subsequent irritation, but although the same local treatment was employed with both teeth, the other one got well in about half the time the pulpless one did. Since then I have noticed the same thing in a few other cases, so now I believe that where the pulp is not congested we should always wait to see if the tooth will respond to treatment within any reasonable length of time with the pulp present. If we eventually find that the pulp is the cause of the irritation it can readily be removed. One point that cannot be dwelt upon too much is that no cure of the mouth can be permanent unless absolute cleanliness is observed, and to secure this our patients must cooperate with us.

I cannot be grateful enough to Dr. James Truman for his suggestion to pack these pyorrhea pockets with sulphite of quinin after they have been cleansed and sterilized. I have used iodine and found it valuable, but not so much so as quinin. The latter makes an ideal dressing, because it is very antiseptic, it invigorates the surrounding parts and keeps them in a healthy condition, it prevents saliva and other infectious matter from entering the pockets, and as it is gradually absorbed the tissue builds up underneath it to a remarkable extent. Quinin in this form is not very soluble, and it can be easily put in place in the pockets if McKesson & Robbins' compressed tablets are used. It might be thought that the saliva would take it up, but it does not, and when the pocket is well packed with the pieces of quinin tablet mucus soon covers it over. There may be a bitter taste in the mouth for a day or two, but usually it passes or the patient becomes accustomed to it. Where much complaint is expressed a bit

of chocolate held in the mouth will entirely relieve the difficulty.

Dr. White, closing discussion: Tobacco is unquestionably a germicide, but it is just as surely a rank poison, and my observations bear me out in saying that the effect upon the gum is harmful. Furthermore, tobacco chewers have invariably around the necks of the teeth crumbs of tobacco that are the cause of continual irritation, and as a class they don't keep their mouths and teeth as clean as other people.

As regards diet, for the past ten years I have noticed that if I eat beef three times in close succession I have rheumatism in my left arm, and I can cure it by adopting an ordinary vegetable diet. Evidently beef produces autointoxication of some kind to a certain extent, and I feel justified in recommending a change of food in the treatment of pyorrhea.

Of course I don't destroy the pulps until I see what can be done with them if left in the teeth, but when I find the teeth remaining loose I destroy the pulps without question, and in such cases rarely have a failure. Most of my trouble in teeth where the pulp has been extirpated has come from getting a little of the chloro-percha through the end of the root. As regards salt, I have found it good as a tooth powder in many cases and have so prescribed it in pyorrhea.

PRESIDENT'S ADDRESS.

BY G. L. S. JAMESON, D.D.S., PHILADELPHIA. READ BEFORE THE
PENNSYLVANIA STATE DENTAL SOCIETY, AT WILKESBARRE,

JULY 12-14, 1904.

We are to be congratulated that we meet to-day in such a delightful place, and the hospitable welcome that has been so graciously extended to us, together with our environment, will aid us in putting forth our best efforts in our work. We have left our offices and come here to take counsel for our general good and to learn from our fellow practitioners by essays, clinics, demonstrations and the less formal conversational exchange of incidents of practice. We will return to our professional duties better stomatologists, for by conferring together we will have added to our knowledge and will feel that we have aided in furthering the progressive work of our profession, which has

for its object, as the charter of this society states: "To lessen human misery by investigating the diseases incident and remedies applicable to the mouth and its dependencies."

We cannot but feel disappointed that our society does not have on its roll of membership all the ethical practitioners of this state, but unfortunately the profession of dentistry—like all professions—has a large number of members who accept all the benefits of the labors of their fellow practitioners through organization, its legislation, enforcement of laws, and improved methods in practice, and yet do nothing in return for the profession that gives them a livelihood. Some communication from a committee of this society should be sent every ethical practitioner, stating strongly and clearly why they should become members of a local society and the state society, and also call to their attention the great benefits that would come to them individually and to the profession generally by so doing. No man who wishes to advance can hope to do so unless he keeps in touch with the progressive members of his profession, and in dentistry—as in all learned scientific bodies—this can be accomplished only by attending and taking part in the meetings of our local, state and national societies, and the international congresses when possible.

It may safely be said that no real progress was made in dentistry until its practitioners were organized through the efforts of Dr. Horace Hayden, who worked for twenty-three years before he was successful in forming the first dental organization—The American Society of Dental Surgeons of New York. Organizations form a medium through which individuals may exchange the results of their efforts, their failures and their successes, and it is evident to any one giving this matter serious consideration that the man who through indifference or for any reason neglects this great opportunity for advancement cannot hope to take rank with the leaders in his profession. Men are like stones in the running stream—they are shaped by rubbing against each other, and those that do not keep in the current, but rest in quiet eddies, must remain unpolished.

In the last few years steady progress has been made in dental legislation. New laws limiting the practice of dentistry to the duly qualified have been passed in several states, existing laws have been strengthened and others revised. It is necessary not

only that there should be laws limiting the practice of dentistry to those qualified, but it must be seen to that these laws are enforced by assisting the officers of the state in obtaining evidence against illegal practitioners who disgrace the profession of which they claim to be members. This society may congratulate itself that in the committee on enforcement of dental law it has one who with vigor and ability has done much for the lasting good of our profession, by assisting in the prosecution and conviction of unscrupulous, incompetent, illegal practitioners, who prey upon the ignorant and thoughtless. The court has recently decided that no corporation can practice dentistry in this state, and this committee can and possibly will compel every such company to cease conducting dental parlors.

The public should be educated to know that advertisers in any branch of the healing art are to be avoided, as they are considered outcasts by their profession and would not be admitted into any of its organizations. Any member of a profession with ability, integrity and industry can win success, and it is the men lacking in these qualities who resort to advertising powers and ability they do not possess, and thus prey upon the poor thoughtless individuals who are enticed into their parlors. Quackery has been a thorn in the flesh of medicine as well as dentistry at all times and will continue to bring disgrace until people are better informed as to the ethics which control the practitioners of both callings. They must be taught that men of honesty and ability, men who are to be trusted professionally, do not resort to such methods, and that any one advertising in any profession is to be looked upon with suspicion.

It is unfortunate that a uniformly high standard of preliminary and dental education does not exist in all the states and territories, for then the question of reciprocity would be a simple matter. As it is there is such a different standard in the various states that the exchange of licenses is an impossibility. It has been suggested that an examination of a standard equal to that required by any state should be held by the National Dental Association each year, and that the practitioner or recent graduate passing such examination should be entitled to practice in any part of the Union upon having his diploma registered. However, before this ideal condition could be brought about a law would have to be passed

in every state recognizing such a degree or giving optional authority to state officers to do so. While the majority of dentists continue to practice in the state where they first took up their professional work, there are many who, for change of climate or other reasons, wish to change, and it is a great hardship for such individuals, who may be renowned in their fields of labor, and who may be of acknowledged skill and education, to be compelled to undergo an examination. Reciprocal arrangements with New York have existed for the past year, and a number of licenses have been granted by Pennsylvania authorities to persons holding New York diplomas, and vice versa. In all new agreements of this nature there are generally some technicalities and defects that time only can point out, and when these have been agreed to or eliminated, and when both parties work together for the general good of the profession and a greater degree of liberty in the field of practice, then there will be perfect harmony. When the dentists throughout the country fully appreciate the great privilege that it will be to be able to go freely from one state to another, no doubt they will, through the influence of their state societies, have such laws passed as will bring about a universally high standard in educational requirements, that general reciprocity may follow.

At the present time there is considerable agitation about educational matters in reference to preliminary requirements and the number of years that should be required at dental colleges. At the recent meeting of the American Medical Association the president in his address advocated that the preliminary education of a medical student should equal a three or four years' college course, that his medical education should cover four years of didactic and clinical teaching, and that after graduation he should have hospital experience before beginning practice. While this high standard is in advance of that required at present of the medical graduate, it shows clearly what the leaders of that profession think about the present educational standard, and it is only a question of time when all the leading medical colleges will require that in order to matriculate the student must have a bachelor degree or its equivalent. In fact, this is now required by one medical school, while others require the completion of the sophomore year in liberal arts or natural science.

In reference to educational requirements, I will quote portions of a letter from a prominent banker of Philadelphia and a man interested in hospital management: "Each additional year of school or college work means just so much broader an outlook when the time of taking up a profession or entering business is reached. It is my experience that the men who have had college training prove more capable and advance more rapidly than those who take up their life work without this preparation. In investigating the qualifications of applicants for the position of resident physician or for taking business positions, I always want to know what the preliminary education of each has been. The men who have had college training almost always come out ahead. What this training has given is something intangible—a knowledge of men, of life, if you will, a glimpse of a broader horizon, a realization of possibilities and opportunities which is hardly achieved in any other way. It is not the facts learned, for there are probably few who could pass an examination after leaving college, but the contact with men and the mental training which are of lasting value. * * * Our American business man—the most successful of his kind—has often one serious failing, the absence of culture, the lack of ability to make the fullest use of his well deserved success. College training undoubtedly gives that broader outlook and, whatever the work later undertaken, is a sound foundation on which to build."

The practice of dentistry each year becomes more scientific and comprehensive, and demands that the dentist of today should have a more liberal knowledge of chemistry, histology, bacteriology and pathology than ever before, so as to keep up with the advancement not only in our own but in other professions, and in order that these and the many other subjects may be fully understood the dentist should have at least completed a high school education. As our high schools are free advanced education is within the reach of all, and by raising the preliminary educational requirements we will do much to elevate the status of our profession, as the only aristocratic standard in America should be that of education. Candidates before entering upon the practice of dentistry should have a high school education of three or four years or its equivalent, and should have four years of study at a recognized dental college, consisting of four courses

of lectures of eight months each in four different years. In addition to the above requirements each candidate should have a moral certificate, signed by two ethical dentists, indorsing the holder as one worthy to practice dentistry and who would be guided by the ethics of the profession he wishes to enter.

If the profession of dentistry is to rank with that of medicine its educational requirements must be equally high. They were equal until a few years ago, when the medical course was extended to four years, with preliminary requirements showing four years' study at a high school. The leaders of our profession were much gratified when the National Association of Dental Faculties, after due deliberation and discussion, agreed at Asheville last year that it was to the best interests of the profession that the dental course should be extended to four years, and that for matriculation the student should have a certificate showing he was eligible for admission to the third year course of a high school. While this is an advance in the right direction, many think that this matter should not be allowed to rest until the preliminary requirements are equal in every respect to those of medicine.

For twenty years the National Association of Dental Faculties has labored for a higher standard of dental education, and it will be most unfortunate if the work of this great organization, which has engaged the best talent of our profession, should be in a measure undone by the withdrawal of certain colleges which wish to return to the three years' course. This society, representing as it does the dental profession of Pennsylvania, should put itself on record as endorsing the action of the National Association of Dental Faculties in increasing the course to four years, equaling—as it should—that of medicine.

An attractive and interesting feature of state meetings is the exhibition of dental appliances, and we must not forget that the dental manufacturer has been quick to supply our changing needs and to carry out our mechanical suggestions. His inventive skill has been a great factor in the development of modern dentistry, and I doubt if any profession has superior instruments of design and workmanship, which add greatly to the comfort of the patient and the operator. We bid them a fraternal greeting and would have them know that their scientific and mechanical art is appreciated.

Among the scientific investigations that have been given much attention during the past few years I would mention that of the study of the saliva, known as sialo-semeiology. This subject was first taken up by a member of our profession, Dr. Michaels of Paris, who read a paper before the Third International Dental Congress at Paris in 1900. This very important work has been followed up extensively by Dr. Kirk of our society, who has shown the great value of the study of the saliva as a means of enabling the medical and dental practitioner to account for many pathologic conditions that up to this time have not been thoroughly understood. Dr. Kyle of the medical profession has also given this subject considerable attention, and during the past winter read a paper before The New York Institute of Stomatology. Dr. Kyle states that while his investigations were made primarily from a medical standpoint, yet some of the principles involved are applicable in many pathologic lesions treated by the dental profession.

An important subject that is being discussed and written about is prophylaxis, which has been defined as "the act of preserving from or of preventing disease." Never before has the dental profession given the subject so much thought and attention, and the practitioner who impresses upon his patients, young and old, the necessity of systematic cleansing and sterilizing of the mouth and teeth, and of frequent visits to the dentist for this purpose, will have done much in lessening the process of decay and other pathological conditions.

The use of the X-rays is becoming more generally recognized in dental practice, and their value in the diagnosis of impacted or unerupted teeth, necrotic bone, inflammatory lesions, exostoses, pulp nodules, irregularly shaped roots, pus pockets, the location of broken instruments, the projection of fillings and instruments beyond the apical foramen, and in studying fractures, is fully established, and they are becoming more largely employed. It has also been claimed that the X-rays have been beneficial in periodontal inflammation and pyorrhea alveolaris.

Many practitioners have adopted the practice of devitalizing pulps by the use of cocain with the pressure method, filling immediately the root canals, with great satisfaction to themselves and their patients. In this way they save time and often pain, and

lessen the possibility in the future of peridental troubles, which are undoubtedly often due, directly or indirectly, to arsenic, the action of which is so difficult to limit when applied to the pulp.

In reference to clinical dentistry, I would say that the more general use of porcelain is to be commended, on account of its artistic appearance and for its wide range of usefulness in saving comfortably and effectually by filling a large number of teeth that in years past would have been crowned. The question of high and low-fusing porcelain bodies is one that must be settled by the individual practitioner, as each produces results satisfactory in proportion to the artistic skill and thoroughness of the operator.

Removable bridgework with saddle is being more used, and very successfully in cases where no means of substituting the lost dental organs is possible other than a plate, which must always be more or less objectionable and a last resort.

During the last year more attention than usual has been given to the study of orthodontia, which is largely due to the consideration given this subject at the last state meeting. Orthodontia, if properly understood and practiced, with normal occlusion of the first molars as a guide and starting point, will do more to win the hearts of many patients to a high regard and appreciation of our profession than any other branch of dentistry. Think what it means to a parent to have the face of a child reclaimed from ugliness and deformity to the Grecian type of beauty, which can and has been done. Can any specialist of the healing art do more for the comfort and lifelong happiness of his patients? The more the question of orthodontia is studied and the better it is understood, the more convinced we shall be that in large cities and among busy practitioners it should be practiced as a specialty of dentistry.

The report of the Surgeon General of the Army, in reference to the services of the dental surgeons in the regular army, is most gratifying. His words are that "their work has been of a high order and deserves commendation." The number of soldiers treated by army dentists during the year ending June 30, 1903, was 16,102, and the number of operations performed 49,483. It is to be hoped that before another meeting of this society occurs dentists will have been appointed in the Navy, as members of our profession are working to bring about the needed legislation.

During the past year, through the efforts of Dr. C. D. Hart, the criminologist and one of the inspectors of the Easton Penitentiary, a dentist has been appointed to look after the teeth of the prisoners. The warden, a man of great experience in prison management, reports that the general health of the convicts has been much improved, that there has been a great falling off in the use of drugs for alimentary troubles, and that the relief of pain and irritation should lessen the number of cases of violence and insubordination, as pain is often the cause for evil acts.

A subject of not a little interest to every practicing dentist is the position the profession holds socially. All men would be well thought of and are gratified when their efforts for the good of others are recognized and appreciated. Surely there is no calling greater in the sight of all men than that of the healing art, that has done and is doing so much for humanity in relieving pain, in overcoming deformities, and in prolonging life. The question may be asked—Is any specialty of the healing art of greater or less importance to humanity than any other? Is the surgeon who removes a limb or sets a bone of more importance than the oculist who restores sight to the blind, the aurist who restores to the deaf the sense of hearing, the laryngologist who, by prompt intubation, saves life? Is the obstetrician, gynecologist, genito-urinary or rectal specialist, doing more for suffering humanity than the general practitioner, or one who practices internal medicine? Take the dentist, who must have a good preliminary education and who takes a course of four years largely devoted to the study of medical subjects, and who must, when fully qualified to practice, be an educated specialist, are his services of less importance than those of any other of the specialists of medicine named? The conscientious dentist gives his very life for his patients, and labors harder and makes greater sacrifices than any of the specialists of medicine. He relieves pain, corrects deformities—changing the disfigured face often to one of beauty—and restores or substitutes the natural organs of mastication, thereby curing or preventing many of the distressing diseases of the intestinal tract. I claim that neither the family physician nor any specialist should be more highly regarded or appreciated than the family dentist, and I am quite safe in saying that many persons and families are quite as much indebted for bodily comfort,

pleasing appearance and length of life, to the family dentist as to the family physician, and there are many who would feel quite as bad in changing the former as the latter.

Some may think that the work of the dental practitioner is disagreeable—and it sometimes is, owing to a lack of refinement on the part of some patients, but in a practice among refined people it is less objectionable than that of any specialty of medicine. What of the surgeon who opens abscesses or treats syphilitic conditions, the odor and sight of which would almost sicken the layman? How about the daily work of the genito-urinary specialist, the rectal surgeon, and the physician who treats smallpox and other loathsome infections and contagious diseases? Is this work more refining and elevating than the practice of dentistry, and should the one who follows this nature of work, noble as it is, be more acceptable in the drawing room or public assembly than the dentist of education and refinement? Do the people who regard the social standing of the dentist as less than that of the physician realize that at one time the surgeon was the village barber who bound up wounds, set bones, and bled the prince and the peasant, and that the red stripe on the barber's pole indicated the practice of surgery? It is quite true that the village barber also extracted teeth, which was the range of dental practice at that time, but dentistry has advanced as far away from what it was then as has surgery. Unfortunately, however, dentistry in the minds of the many is associated with that impressive operation of tooth extraction, which until recently was an unpleasant experience that most individuals knew more or less about, and it will be years before it will have been dissociated from the modern practice of dentistry, of which it is only a mere incident. Many people of the present generation know nothing whatever of dental pains or tooth extraction, and dentistry to them is associated with the correction of irregularities and many satisfactory operations that have preserved in beauty and comfort the organs of mastication that play so important a part in the preservation of health and the prolongation of life.

I regret to say that some of the prejudice against the social standing of the dentist has been brought about and fostered by the family doctor, who until recently knew but little about the dental troubles which are so numerous and far-reaching, and as

he did not regard very highly the ability of the dentist, frequently patients were allowed to suffer for long periods before they came into the hands of the family dentist. It used to be that the physician would say, "He is only a dentist." Does it not seem ridiculous for the physician of the family, who himself until recently gained his knowledge of the comprehensive field of medicine in two short terms, and who practically knew nothing of modern scientific medicine, to exalt himself above the dentist who perhaps spent an equal time and possibly more in learning his specialty, and who probably was his equal in education and refinement? There is about medicine a mysticism that begets admiration among the masses, while dentistry is positive and less occult. I would not elevate dentistry by belittling medicine, but I would that each were given the honor due. The hand cannot be the eye or the ear, but each is equally important, though different in its function. What would be the state of our bodily health and comfort if modern dentistry were not in existence? The profession of which we are members has made more rapid strides than any other branch of the healing art, and as time goes on it will be more and more appreciated by the people that owe to it so much of health, of beauty and of comfort. If dentistry had done no more for humanity than to give to it the greatest boon of modern civilization—anesthesia—which has made possible modern surgery, the world would owe it a debt of eternal gratitude.

HOMEOPATHIC REMEDIES IN DENTISTRY.

BY ROBERT WAKEFIELD, D. D. S., AND A. C. SMITH, D. D. S.,
CRANFORD, N. J.

ACONITUM NAP.—The chief use of this remedy is in pulpitis, especially where it occurs after the tooth has been filled, and where the pulp is exposed or nearly so.

BELLADONNA.—This is valuable in all cases of periodontal irritation, especially when given in alternation with *mercurius vivus*, and it will induce resolution in fully sixty per cent of these cases. It can also be used as a preventive of periodontal irritation while treating devitalized and septic roots.

HEPAR SULPHUR.—This remedy is used to induce suppuration, where the inflammation has advanced too far for resolution to take place without the formation of pus. This drug causes a

rapid pointing of the pus, and shortens the period of intense pain which accompanies the formation of an alveolar abscess.

MERCURIUS VIVUS.—The uses of this remedy are similar to those of belladonna, and it has a special field in stomatitis, especially where these troublesome ulcers appear in successive crops. It has also been used to some extent in pyorrhea alveolaris.

ARNICA MONTANA.—Is used chiefly for the pain which follows the extraction of teeth where the alveolar process has been unduly fractured, also where the teeth are sensitive to pressure after prolonged malleting.

These remedies are administered in the 3x, and preferably in the tablet form. It has been our custom to administer one tablet every two hours.

DIAGNOSIS OF FRONTAL SINUS OSTEOMA BY THE X RAYS.—The difficulties attendant upon the diagnosis of this condition ought to be simplified by the employment of the Roentgen rays, but thus far no skiagraphs of the lesion have been published. G. Perthes (*Archiv f. klin. Chir.—Medical News*) reports a case where the X rays proved to be of the greatest importance both as regards the diagnosis and the determination of the site of operation. By the removal of the growth the malposition of the left eye was corrected and the headaches and other symptoms disappeared. Without the rays it would have been impossible to recognize the presence of the bony tumor on the roof of the orbit which was displacing the bulb. No elevation could be detected on the forehead, and the tumor might as well have been exostosis. The skiagraph taken in two planes showed that the growth extended 4 cm. above the roof of the orbit and beyond the median line to the other side.

SALIVATION IN NASAL OBSTRUCTION.—Rugani (*N. Y. Med. Jour.*) produced artificial nasal obstruction in a dog by curetting the nasal mucosa on the right side, and by suturing the right nostril. The dog was kept under the influence of morphia in order to prevent it from forcibly destroying the obstruction. The adhesion of the walls was incomplete, but a few days after the operation an abundant salivation appeared, together with congestion of the conjunctiva, and lachrymation; this salivation continued with slight diminution until the death of the animal. The experiment is of interest on account of the observation of a number of rhinologists, that there is an increase of saliva in patients with nasal obstruction in the shape of hypertrophic rhinitis, adenoids, etc. In the present experiment the salivation was probably reflex, due to irritation of the mucosa, through the presence of cicatrices and granulations affecting the terminals of the trigeminus. From these, through its branches to the facial nerves and from the latter to the corda tympani, the irritation affected the salivary secretion.

Digests.

RESEARCH WORK AND ITS APPLICATION: THE APPLICATION OF THE RESULTS OF SCIENTIFIC RESEARCH TO PROBLEMS IN DAILY PRACTICE. By S. A. Hopkins, D.D.S., Boston. Read before the Fourth International Dental Congress, 1904. In the profession to which we have the honor of belonging we meet with a class of men who boast of the fact that they are practical. These are frequently men of rare manipulative skill and of great mechanical ability, and in a profession calling for the hourly use of marvelous dexterity, and in which much of the time is occupied in restoring impaired teeth to usefulness or in replacing lost teeth with artificial substitutes, such men deserve and secure a large measure of success. Too frequently, however, the boast of being eminently practical is but a cloak to cover the inertia or indisposition which renders an individual unable or unwilling to follow the advance of students of science who are laboring unceasingly to thrust the reaping-knife of original investigation into the ripening harvests of human knowledge that surround us.

Those of us whose privilege it is to teach must frequently feel that among the instructors in our dental schools there is a division of taste and interest too marked for the well-being of the school, and a lack of concord which diminishes the force of our instruction, and makes it less readily available for the uses of the student. We frequently have on the one hand an excellent body of intelligent gentlemen teaching operative and mechanical dentistry, orthodontia and prosthodontia, who have only a rudimentary knowledge of histology, pathology and bacteriology, and who honestly feel that these and allied sciences have but little bearing on their professional work. Indeed, the very fact that while they have wilfully ignored these subjects they have nevertheless achieved success in building up a lucrative practice, is satisfactory evidence to them that such knowledge has no more important bearing upon their professional career than Greek archæology has to the work of a Hibernian laborer.

On the other hand, in many instances we are forced to depend for our teachers in the scientific branches upon men who have

never studied dentistry. They are men of high attainments and are enthusiasts in science, in which they are completely engrossed. They are unable to point out the practical application of their wonderful knowledge to the daily problems arising in dental practice—if, indeed, they have not lost sight of the fact that the chief value of such knowledge lies in its ultimate application. Medical education presents the same picture. Pathology, for instance, was originally studied in order that the observance of morbid processes might lead to the discovery of some means by which the practitioner could thwart the disease which gave rise to such morbid conditions. Today pathology is studied for the sake of pathology, and its application to the needs of the practitioner is a secondary consideration—if it be not entirely lost sight of. Indeed, I recently heard a professor of this science in one of our great medical schools declare that the application of his work was never thought of, and that he preferred men as his assistants who had no knowledge of the practice of medicine.

Such an attitude as this on the part of a teacher in our medical or dental schools might easily tend to stultify any interest which the student might have developed in the study of the biological sciences, if such interest depended upon the application of his studies to the practice of his profession. The value of research work cannot, however, be estimated by the use which immediately follows its announcement. Indeed, it is highly probable that so far as the ultimate benefit to mankind may be considered, the position of the eminent pathologist to whom I referred is the best one that can be chosen, for it is quite conceivable that if the worker in the untilled fields of science should be oppressed with the nagging necessity of connecting all his results with some practical affair of daily life, his mental horizon would be woefully narrowed, and his limitations would be so great as to render much of his work ineffective. In our great anxiety for results we are prone to lose sight of the fact that the very spirit which spurs a man on to profound investigation may chafe at the suggestion of the utilitarian who insists upon seeing a prompt application of every recorded fact of science. The study of science for science' sake is quite as inspiring to many minds as the study of science for its immediate bearing upon the problems of life. It must not be forgotten, however, that the storing up of scientific results

could hardly be carried on with the enthusiasm which inevitably accompanies such work were it not for the confident assurance that the time would eventually come when such results would be available for the needs of humanity.

A striking illustration of this principle may be found in the fact that the laying of the Atlantic cable was made possible by a mathematical formula worked out nearly half a century before transatlantic communication was thought of, and which had had no practical application until the problem of bringing the two worlds into daily communication with each other was suggested. It was then that Sir William Thompson, now Lord Kelvin, remembered the experiments of the French mathematician Fournier in measuring the rapidity with which heat travels along an iron bar. By the application of Fournier's formula to the great electrical problem which then engaged the attention of both countries, Sir William was able to assure the capitalists who sought his advice that a cable built according to the plans he indicated would be a positive success. The world has seen the vindication of his prophecy, and has had reason to be grateful to Fournier for recording a scientific fact that for many years had seemingly no practical application to the affairs of life.

For many generations chemistry has been storing up facts the application of which in many instances was extremely problematical. Physiology began to advance and to avail itself of the results of chemical experimentation—of results which in many instances had been previously unavailable for any useful purpose. This union has resulted in the wonderful science of physiological chemistry, which already has delved deeply into the problems of vital existence, and which gives promise of leading us to the very boundary line of human knowledge, where the material facts of human life and human thought become merged in the unfathomable mystery of the spiritual. Instances are not wanting in medical and dental science wherein the investigations of scientists have been immediately followed by the discovery of a method of preventing or successfully controlling disease. Indeed, it may be confidently asserted that every advance from empiricism has come as a result of scientific investigation, and the most self-centered, avaricious seeker after commercial success will welcome with enthusiasm any scientific advance which simplifies his work or

gives promise of increasing his income. It is, however, the other class of scientific work—that which is not immediately productive of utilitarian results—which is also worthy of our attention, and for which I am now pleading. Research work which has no immediate application to the needs of the world may fail to hold the attention or to excite the applause of the average man of affairs who prides himself on being practical. Yet this same work may still be of utmost value in pointing out the road, and in clearing the way for some other investigator who with the start thus given may successfully solve an important problem and reveal its bearing upon the world's work.

Indeed, if time allowed it would not be difficult to show that almost every piece of research work that has been of value in its application to human needs has had its inspiration in some other work which may perhaps have fallen far short of the practical requirements of mankind. To awaken an interest in science for its own sake in our profession would be to awaken a broader intelligence, to give birth to new and better ideals, and to break the fetters of concentrated application to routine duties which make dentistry the most exacting and narrowing of the professions. Without decrying the necessity of discussing everything that has a bearing on the successful filling of a tooth-cavity, I would suggest that a too frequent repetition of the old formulæ may narrow our intellectual horizon and dull our perceptions, and when such discussion degenerates to the point of recalling the mythical experiences of the Dumas of our profession, our politeness is taxed unfairly and our time is unjustly wasted. Our politeness is taxed, because when a man recites successful operations performed by him, with the implied meaning that he alone could have performed them, and relates the marvelous cures that take place under his skillful treatment, we are all convinced that the speaker is romancing, but courtesy prevents our saying so, and indeed there is no way of proving the falsity of his statements. Upon the younger men the effect is discouraging, for they know that they themselves cannot achieve the exalted standard of skill claimed by such a speaker, and they have not learned to discount his claims. For these reasons I would plead that clinical work be performed at the proper clinic, and not in the imagination of

those rhetorical romancers who mistake the courteous silence of society members for credulous belief in their impossible tales.

I would plead, too, for an interest in subjects not directly applicable to the daily operations of our profession, because such subjects broaden our viewpoint and develop a sense of values which the too constant riveting of our attention upon the point of an instrument is apt to destroy.

With this preface, and with an apology for bringing to your notice some unfinished work—and work which may be said to be unsuccessful in the fact that it has neither fulfilled my expectations nor revealed a field of application—I will call your attention to certain mouth bacteria which have the interesting property of producing mucin, and which may be found, on further investigation, to bear a causal relation to certain pathological conditions which we are repeatedly called upon to treat. Mucin is a nitrogenous matter found in several of the tissues of the body, and notably in connective tissue. It is also found in several secretions of the human body, and in certain secretions of animals belonging to different species. It is, as you know, found in mucus, and its viscid consistence is so well known that it is scarcely necessary to dwell upon it. The fact that bacteria are capable of producing a gelatinous substance has been demonstrated by a number of bacteriologists, and both Dr. Black and Dr. Williams some years ago pointed out very clearly the association of this gelatinous substance with caries. In this connection it is well to remember that all slimy products of bacterial activity are not necessarily mucin, and at the same time it will be well to remember that the production of mucin is not confined to a single species of bacteria. We have known for many years that even macroscopically salivas of different individuals differ greatly, and we know also that the saliva of the same individual differs at different times and under different conditions of health. We have come to associate the stringy mucus-laden saliva with rapid carious action, and we have speculated as to the reason for this condition without receiving a satisfactory answer, except such as is found in the mechanical binding of the lactic acid-producing forms to the dental enamel walls by the gelatinous mass. Those who have never made the tests would be somewhat surprised to find that this ropy saliva is usually quite alkaline in its reaction, that in a majority

of instances there is a copious flow, and that this flow sometimes becomes very excessive.

If we should carry our observations still farther we would discover that this stringy saliva is a far better medium for the cultivation of bacteria than is a clear watery saliva, particularly if that thin, watery saliva be slightly acid in its reaction. In other words, bacteria multiply very much more rapidly in the thick, mucus-laden saliva which has marked alkaline reaction than in the clear, watery product which has a neutral or a slightly acid reaction. An acid reaction retards bacterial growth, and is not usually associated with excessive carious action.

If we go still farther, and cause our patients to follow the Fletcher method of excessive mastication, we shall notice that the saliva undergoes a change, and that which was thick and stringy becomes much more clear, and is a less suitable medium for bacterial activity. This would indicate that the salivary glands, if stimulated in a normal way by proper mastication, are often capable of pouring out a perfectly healthy normal product in response to normal stimulus. An interesting problem in cytology is here suggested, which time will not permit me to discuss, but the fact may be regarded as established that healthy normal exercise produces healthy cell action, resulting in healthy secretion. If we carried our observation still farther we might notice other peculiarities of the patients who secrete thisropy saliva which I have described. We would be apt to notice that these are patients who eat rapidly and who do little chewing, and that they belong usually to that type which we call nervous; but for our present purposes these observations are unimportant.

It has long been known that bacteria break up chemical compounds into simple elements, which unite to form other compounds which are frequently simpler and more stable than the original combination. We have come to regard this property which bacteria have of producing fermentation as being their special function, and we know that life itself depends upon it. The refuse matter of the earth is decomposed and changed into suitable food for plant life by the action of these microscopic allies of humanity. In the human body proteids are split up into gastric digestive products by their action. Sugars are split up, and a number of acids, such as acetic, butyric, formic, and lactic, are produced. Starches may be changed to sugars and fats split up into fatty acids and glycerin by the agency of

bacteria, and it may be reasonably questioned whether life will not become extinct when the antiseptic which will sterilize the alimentary tract has been devised. It has been pointed out by Dr. Miller that the production of lactic acid in the human mouth cannot easily be carried beyond three-fourths of one per cent because of the destruction of the lactic acid bacteria by the lactic acid which they produce, so that in all experiments on the destruction of teeth by acids we must take into account that the acid which produces the pathological changes in the teeth never reaches the strength of one per cent. Many bacteria are in another way victims of their own industry, because they have the property of producing enzymes which are capable of digesting the organism which produces them, and sometimes other organisms as well. I am fully convinced that upon this phenomenon will be found to rest the explanation of immunity from disease, and that the self-limitation of infectious disease finds an explanation in this theory.

If one of the pyogenic or pus-producing forms, like *B. pyocyaneus*, be grown for several days at the body temperature there will be found a scum on the surface of the bouillon. If the tube be thoroughly shaken and again placed in the incubator, at the end of three days a new scum will have formed. Repeating this operation each third day for about three weeks, you will find a deposit in the tube of broken-down bacteria which fail to take the stain readily. Emmerich and Low explain this change by the development of an enzyme which first agglutinates and then destroys the bacteria. The bacteriolytic action is, according to Vaughan, the result of a digestive action upon the nucleo-proteids of the bacterial cell. There is some evidence that in the human mouth, which is never free from bacteria, enzymes may be formed which retard pathogenic activity, and it is not beyond the range of possibility that in the large amount and variety of bacterial activity may be found compensating ferments which impose limitations upon the work of those bacteria that we have come to look upon as destructive to the teeth and to the health of our patients.

Mucin production is not limited to a particular mouth bacterium. A number of forms, *B. subtilis*, *B. coli commune*, *B. megatherium*, and others, have the property of producing this substance. It is interesting to note that the many lactic-acid-producing forms found in the mouth are not particularly active in the production of mucin,

and this is a point to which I wish to call attention. While many of the lactic-acid bacteria are capable of producing mucin, when not engaged in the production of lactic acid—that is to say, when growing in a medium free from carbohydrates—these same organisms in the presence of carbohydrates will produce lactic acid, and their mucin production will be reduced if not entirely checked. An organism carefully studied by E. K. Dunham of New York produces mucin in large quantities in milk cultures, but does not coagulate the casein, at least for several days, and the whey becomes so slightly acid as to be hardly noticeable. Another peculiarity of mucin production to which attention was called by Leo F. Rettger of the Sheffield Laboratory, Yale University, was that bouillon cultures became very slimy at a very early date, but while this ropiness was very well marked, the mucin was difficult to separate. At a later date, when the ropiness had in a measure disappeared, the mucin was more easily precipitated. This mucin, you will understand, is precipitated by weak acids. He later accounts for this by stating that, as the culture grows older, a gradual production of alkali in the fluid increases the solubility of the mucin, and in this way the liquid is rendered less slimy.

It has been my hope to point out in some definite manner the part which mucin plays in the destructive changes known as dental caries, but further investigation is needed to show in the complicated bacterial life of the mouth how important mucin production is.—*Cosmos*.

REMODELLING AND DUPLICATING OF VULCANITE DENTURES. By T. Evans Johnston, L.D.S., London. I wish to say a few words on the remodeling of badly fitting vulcanite dentures to a new impression of the mouth and also on the making of duplicate sets. I have been using a method of treating such cases for some years, which has smoothed away many difficulties that I used to encounter in this class of work. I obtained the idea from Mr. Charles Matthew some years ago, and lately in one of the journals an article appeared dealing with the same method, but done by means of a special flask which was advocated for the purpose. I have, however, found an ordinary three-piece flask all that is necessary. Some of the occasions in which I find this device of great use are the following: Where a full vulcanite

set, upper or lower, has lost its fit owing to changes in the mouth, such as absorption of the alveolus, the removal of roots and other causes. Or where a nearly full set has become useless owing to the loss of the only tooth or last few teeth that held it in position. In these cases it is a great advantage to the patient to have his old set made to fit the mouth comfortably, even if it is only till the mouth is ready for a new one. In a great many cases, however, I find that to remodel by this method does away with the necessity for a new set altogether, or even if the patient does get a new set, the remade one comes in very handily as a spare set. Also in other cases, such as the repairing of full lowers broken in half, and the making of duplicate sets for those who wish to have a spare one in case of accidents, I find this method gives excellent results. I used sometimes to refit sets by other means, but my experience was never such as to induce me to do it oftener than I could possibly help, as I always found that the result and the fee did not justify the time and trouble involved. But since adopting this plan I do not hesitate to remake sets in suitable cases where it is desired, finding that I can do so very easily and with satisfaction both to myself and the patient.

I will now describe the method, which consists of flasking the case in such a way that it can be removed bodily from the flask for the purpose of removing the teeth from the vulcanite and putting them back in the flask, thereby getting rid of the old vulcanite altogether. An impression of the mouth is taken in the usual way, either in plaster or composition and cast. The case is then tried on the model. It may not go on at all, or may be so wobbly that you do not know what position is the correct one, but all you have to do is to cut away freely any excrescences or edges or rugæ that are in the way. If I have any difficulty in seeing what is keeping it I wiggle the case slightly on the model and cut it away at the white plaster marks that are left on the under surface. The great thing I find is (in the case of uppers) to get the palatine portion of the case lying as flat as possible, for if you get this right you may be sure that the rest is, as it is not the palate where changes occur in the mouth.

All this can be done in a few minutes. The case is next waxed on to the model and wax run into all the places where you wish

to fill up, but you do not need to be particular to have wax all the way under the case so long as the edges are tight to keep plaster from running in between it and the model. Any teeth that require to be added are put on with wax, and any places where you wish to extend the case or add gum are waxed up. You may wish also to cover exposed pins, etc. The model with the case on it is then placed in the lower part of the flask and plaster brought up to the gum edge. The middle part of the flask is then lubricated inside with oil, vaselin or soap and placed in position. Plaster is run round the faces of the teeth and gum and crowns of the teeth. The plaster is trimmed up, smoothed and lubricated, the palatine portion which remains filled in with plaster, and the top of the flask put on. Before filling in the palatine portion you may make a polishing plate if you wish, or you can do so afterwards.

When the plaster has set and the flask has been opened, the case will be found imbedded in a ring of plaster in the middle part of the flask; this having been well lubricated allows the plaster with the case to be removed. The ring of plaster is then broken into three or four sections and the case liberated. These sections of plaster are then put back into the middle part of the flask where they were before. The top part of the flask is then put on, and the lower part with the model used as the plug, or it can be packed the other way if desired. The teeth are then removed from the case and fitted into their places in the plaster.

If the back teeth are diatoric and the vulcanite will not come out of the holes, I have found that a very good way is to place them in a crown or inlay furnace and burn it out. I heat them till they are red hot and they come out nice and clean. If some of the teeth get broken in removing them from the vulcanite, all you have to do is to fit in other teeth as like as you can get them.

If in opening the flask pieces of plaster get broken from the model or from any other place where they are of importance, I find that if they are cemented on with thin cement, such as you would use for setting an inlay or even thinner, they will stand heating and boiling and squeezing without shifting.

To make a duplicate of a set you use exactly the same method, flasking the case to be duplicated and fitting in other teeth which

do not need to be *exactly* the same as long as they can be fitted into the impressions in the plaster. In this way you get an absolute duplicate which will feel exactly the same as the old case in the mouth, the vulcanite being of the same dimensions, which would not be the case otherwise. The bite will also feel exactly the same. I have not found the fitting of the teeth as difficult as it might at first sight appear. It also takes far less time and trouble than any other way I have tried.

The advantages of this way of refitting a case are that you get rid of all the old vulcanite, thus making the case as strong as ever. It is a great saving of time, as all you have to do in the surgery is to take an impression of the mouth, and the whole operation takes only about three hours from start to finish in the workroom. There is no trying in necessary, thus saving your own time and the patient's. You can send the case if the patient cannot come back, with every assurance that it will be all right. I have often taken the impression and desired the patient to send me the case from home—returning it when finished—thus enabling him to avoid an appearance in public without the teeth.

I have frequently found that the remodelled set gives more satisfaction than a new one would, especially when the patient likes the appearance of the teeth and the bite is comfortable. Patients who cannot afford a new set are often very pleased to get their old set made to fit comfortably at a smaller fee.

For cases that are smashed in two in the workshop, perhaps while they are being polished by a careless apprentice (a full lower often suffers in this way), all you have to do is to wax the broken ends together and replace it in the flask and treat it by this method. In this way you get rid of all marks of repairing, which would be so objectionable in a new case, besides weakening it.

Then, again, for patients that have recently had the mouth cleared of stumps and bad teeth and cannot wait without teeth very long, instead of making a so-called temporary set (which the patient never realizes is any trouble to make, and perhaps naturally grudges to pay much for), I make the set with a view to remodelling it afterwards and putting gum in front if necessary.—*Record*.

YOUR BREATH. By R. B. Tuller, D.D.S., Chicago.

I'm a

Friend of yours and

I want to have a heart-to-heart talk with you; yes, you.

You are a pretty decent-looking fellow. Your clothes look reasonably clean and tidy, and your linen fresh, and your hands look soft and well cared for, and your nails are well manicured—not professionally manicured, perhaps, but a very decent job, if you did do it yourself. The barber seems to have had you in hand, too; even to a facial massage, with plenty of hot towels.

I don't wish to offend you in the least—not for anything, and, say, now, you must not be offended. Somebody has *got* to tell you—if you haven't a wife—and sometimes if you have. But please don't look me in the eye. Kindly turn your face away while I propound a question. Do you make Limburger cheese a part of your daily diet—no? Well, it might be an improvement if you did. Aha! are you on?

I've been trying to approach this matter as gently and delicately as I could, and I'm glad you've caught on. It is *rank*. You may have your opinion about my eating Limburger, but this is my inning, not yours. I have the floor and I'm talking to you. I just wanted to tell you what you probably don't know about yourself. Your breath—— “Oh, the smell of the jessamine-flower” is much more agreeable; and even a burnt woolen rag—well, you can guess what this is, anyway.

To be plain, the afflatus of that embrasure of your physiognomy is not of that divine inspirational character that impels one to linger in the aroma (?) and think lofty thoughts and sentiments, any more than it would to loll on a hot summer day on the banks of “Bubbly Creek,” in which the offal of the Chicago stock yards discharges and lies festering for many a day. No, I don't think.

On the contrary, cuss words float through one's brain, and not infrequently audibly through the air, and the first impulse (and the last) is to flee—flee as a bird. But what about those patients of yours? They, no doubt, think cuss words all right, and the sin is on your head; but they can't flee—not for the moment; but they may at the first opportunity, and never return.

Now, sir, this is where I'm your friend. I'm telling you in this quiet, sub-rosa way so that you may try and correct the evil and avert

any such catastrophe. That is what it is, and a dum poor advertisement when your patient's tongue never forgets to give you a left-hander after this fashion: "What a pity it is that such a nice, pleasant gentleman and fine operator has such a terrible breath!"

You are not the man? What? Do you deny the *rank* impeachment? Well, sure, there is no suggestion of peach or mint about it. It is *vile*. Oh, possibly not to-day, because your health is better than yesterday—your stomach, anyway—and because you have taken extra precautions; but to-morrow, or next day, possibly in an hour after taking some kinds of food. You can never tell, yourself, whether your breath is tainted or not, so don't get sore at me for giving you the tip and being plain about it. Oh, yes, of course, if you have a very dark brown taste in your mouth you may know that your breath is not like an infant's.

You say you take every precaution as regards cleanliness and hygiene? You brush your teeth and use antiseptic washes three or four times a day? Good! Keep it up! But do you make any effort to regulate your diet—except possibly to deny yourself onions and garlic? Is your digestion good? Knowing it is not, do you take any precautions against the putrefying odors that are extremely evident?

Do you drink? Excuse me, I did not ask you to have anything. Not me. If anyone asks you, begin the new year right and politely but firmly decline. Let your motto be, "No 'suds' for me." Isn't it strange what drawbacks there are to a number of good things in this world—and you can't disguise them, not even with cloves or cardamons. No, the only thing to do is to let it alone. Cling to the sprinkler, though the spray takes all the crease out of your trousers.

But you smoke? Oh, yes, I've seen you. I've seen you (some of you) with one of those *nasty* cigarettes in your mouth, and here in a civilized community. What's that? You've seen me with a rope? Well, not from any craving inclination to smoke rope. Mine is a two-for-fifty taste, with two-for-five resources. But *you* are the target of this topic, not I. Don't go out and smoke anything and go back and breathe it into the sensitive face of the patient you've got down in the chair and who can't get away. Remember, that at your sweetest you do not smell always like the delicate odor of attar of roses.

Oh, of course, you rinse your mouth and even scrub out your mustache, but tobacco takes several hours to fade away, and you

know it. Such efforts as you may use to modify or suppress the disagreeableness is the least you can do, but why don't you use some horse sense? Horses do not pollute their mouths with tobacco.

We have to inflict woes enough on our patients without overwhelming them with a rank breath. Sometimes they come back at us with a worse one, it is true; but we have remedies at hand for temporary relief, while they have none—except to get away from us as soon as they can.

The trouble is, as I have already said, that not one person in a thousand suspects that he has a bad breath until told by some good friend.

Now, what is there to be done for ourselves?—I mean for you. I forgot I was talking just to *you*. Well, use every precaution to keep your stomach in a first-class normal condition, and avoid any ill-smelling diet—that is, ill smelling after it is down. Yes, you have to be mighty careful of the things you may eat and drink, if you want a nice, clean breath, besides using all hygienic measures (and use them often) for odors that emanate from fermenting and decaying food particles in the mouth. Make it a point to use a good deodorant and antiseptic mouth-wash before beginning service for each patient, and if the service is at all protracted, repeat the dose once, twice or thrice. Treat yourself as a suspect at all times and use precautions, and keep your mouth closed while operating. The older you grow the more the need. You know it well enough.

Dioxogen is my favorite mouth-wash, or something of that order. Nothing burrows into the deep and obscure recesses and brings out the offensive substances better than some of the H_2O_2 preparations of about 3 per cent strength. When I get hold of a patient with an offensive breath I very soon introduce a dose of peroxid into the mouth on some pretext or other, or without any, and then follow with peppermint water or sanitol.

When we come to nasal catarrhal conditions in ourselves and others, then we sometimes have something hard to contend with, and should refer and urge the patient, or ourselves maybe, to consult a physician. Disorders of the stomach, too, should generally go to the physician.

You know and I know some dentists who set us to wondering how on earth they hold a practice, but if we had something like lit-

mus to test for bad smells in our mouths a good many of us might get a shock. Don't take any chances.—*American*.

REACTION PRODUCED BY COCAIN IN PRESSURE ANESTHESIA. By E. T. Loeffler, B.S., DD.S. Read before the Detroit Dental Society. Among the many substances that have been used as local anesthetics may be mentioned hydrochlorate, bromid and sulphate of ammonia; the carbonate and nitrate are without effect. Copper sulphate and some of the iron salts, particularly the sesquioxid, produce anesthesia without coagulation at the point of application. Lead acetate is anesthetic, while the zinc salts are not. Among the organic salts or substances, hydroquinin, resorcin, anti-pyrin and the digitalis group are slightly active. Thallin, alcohol, ether and glycerin have no action. The essential oils and similar substances have a remarkable action.

Most of the above-mentioned drugs produce what is known as "painful anesthesia." Some substances, however, as cocain and beta eucain, do not cause painful anesthesia, and are followed by a contraction of the blood vessels, whereas those having a painful action cause a dilation. They also have a caustic action, particularly hydroquinin. The same effect is true also of distilled water.

We can readily see that the objections to most of these agents are, that after the operation has been performed without pain there is a reaction, if too freely used, by return of the blood with great force, pressing upon the nerve endings; or after the use of caustic substances there may be partial death, so that in most cases the pain following is intense and prolonged. There may be loss of parts and severe hemorrhage. At times these agents may be employed with success, when no other means are at hand. All these methods can be made much more efficient if the surface be rendered bloodless by means of astringents or pressure.

I may be criticized for taking up much time in explaining the action of cocain, but there is scarcely another drug that we have to deal with where there exists so much diversity of opinion in regard to its physiological action. Just in what manner the contents of the tubuli are affected is not clear. Huber and others have demonstrated that the nerve fibrils pass between the odontoblastic cells and probably end there—at any rate, their extension into the tubuli of the dentin has not been proven.

There has been a good deal of discussion as to whether cocain acts equally on motor and sensory fibers, or whether it has a selective action. Cushney states that cocain must be considered a general poison of protoplasm, with some selective power for certain nerve tissue, but no specific affinity for sensory rather than motor terminations. He further states that it produces, besides a loss of sensation, a feeling of constriction and a distinct pallor and contraction of the vessels, the astringent feeling being easily explained by the fact that cocain is a poison of protoplasm, and the local contraction of the vessels may probably be due to the same cause.

The anesthesia produced by cocain is comparatively short, but varies with the strength of the solution applied and the vascularity of the part. In most cases the cocain is soon absorbed, and as this occurs the local action disappears and sensation returns. The effects of cocain as a local anesthetic are to be ascribed to its destructive action on the protoplasm of the end organs. In some cases it may destroy their vitality. Muscles, nerves and nerve ends cease to contract or conduct stimuli when exposed for a short time to weak solutions of cocain. Ciliated epithelium cells, leucocytes, etc., become motionless. In some cases the final depression is preceded by a stage of increased movement. The paralysis of the sensory terminations is therefore to be regarded as only a particular instance of an almost general action upon living matter, induced by contact with cocain in sufficient amount.

Perhaps most of you are aware that cocain acts as a general anesthetic when very large doses are taken. Buxton, a noted English authority, states that its true action is analgesic, due not to the vaso-motor constriction which it establishes, but to its influence upon the sensory nerve endings. If an area is rendered anemic and analgesic by cocain, the subsequent injection of pilocarpin will abrogate the anemia while the analgesia remains unaffected. Airlong has shown the same thing by dividing the superior cervical sympathetic of a rabbit on one side, the animal having been previously cocainized. Hypervascularity could thus be seen to exist simultaneously with analgesia.

In the use of cocain for obtunding sensitive dentin, or for the removal of the dental pulp, almost the first question that comes to our mind is: "What will be the reactions?" This question received more or less attention when electricity first began to be used to in-

crease the penetration of cocain into dentin, and now, since the introduction of mechanical means for forcing local anesthetics into tissues of the teeth under great pressure, the same question seems to be the all-important topic. That action and reaction are equal and in opposite directions is a phenomenon in physics, so common in our everyday experience that its practical application in dentistry seems not only probable but possible. After every surgical operation or injury there is a certain amount of reaction which is as a rule directly proportional to the extent of the operation or injury. This reaction we call hyperemia, and in case we have infection, inflammation.

Inasmuch as this question involves a knowledge of the action of the vaso-motor mechanism, it might be well to explain some differences that exist between vaso-constrictor and vaso-dilator nerves, which in many respects are particularly interesting for the reason that fibers of both varieties are found in one and the same anatomical nerve. The sciatic nerve is a good example of this class. That even a superficial knowledge of this fact is extremely important we can readily see, because the effects produced by ordinary methods of stimulation of the one might be wholly or in part masked by the effects produced by the stimulation of the other. From the researches of Anrep and Cybulski it has been found that the vaso-constrictors are more easily excited than the vaso-dilators. As a matter of illustration, they have clearly demonstrated that the simultaneous stimulation of the dilator and constrictor nerves going to the submaxillary gland causes vaso-constriction, dilation appearing after stimulation ceases, for the after-effect of excitation is of shorter duration with the constrictors than with the dilators. Again, Lepine and others have shown that warming increases and cooling diminishes the excitability of the constrictor fibers to a greater degree than in the case of the dilators, also that the vaso-constrictors are more sensitive to rapidly repeated induction shocks of the same strength and less sensitive to single induction shocks than the vaso-dilators. Furthermore, vaso-constrictors degenerate more rapidly than vaso-dilators, and the maximum effect is more quickly reached.

According to competent authority the motor apparatus consists of three distinct classes of nerve cells. Cell bodies of the first class lie in the sympathetic ganglia, their neuraxons passing directly to the vessel walls; the second are situated at different levels of the

cerebro-spinal axis, their neuraxons connecting with the ganglia by way of the spinal and cranial nerves; while the third are wholly within the bulb.

Perhaps this seems too much of a deviation from the subject matter of this paper, but in order to comprehend the nature of the reactions which take place after operations upon living tissue, at least a superficial knowledge of the physiology of the vaso-motor mechanism can hardly be dispensed with. There is, however, a lack of uniformity in the opinions held upon this all-important subject. From the experiments of Airlong, we are led to believe that the astringent action of cocain is of reflex origin. According to the statements of the other equally-important authorities, we are forced to the conclusion that cocain does produce some temporary stimulation in the vaso-motor nerve endings which would, in a measure at least, account for some of the phenomena that take place after local anesthesia.

The latest researches on the action of cocain on the organs of special sense of taste, sight and smell warrant the assertion that this drug has some selective action on sensory nerve terminations, particularly those of pain and touch. Other drugs, as atropin, pilocarpin and muscarin, have a similar selective action on nerve terminations.

The subject of pressure anesthesia is still in its infancy. More scientific as well as practical investigation is necessary to clear up some of these points and establish its general use. Our clinical experience with pressure anesthesia has been too brief and limited in a way to warrant making any definite statements, or to throw any great amount of light upon this subject. While in the majority of cases the operation seems to be a success, there are still too many failures proportionately to make its application universal. The most important complications are hemorrhage, pain and possibly loss of pulp after obtunding dentin. Other objectionable features are anemic patients, or those possessing an idiosyncrasy against the use of cocain, or a hemorrhagic diathesis, to say nothing of cavities or teeth from which the saliva cannot be properly excluded.

I have instructed my students to keep an accurate record of all cases in which pressure anesthesia has been used, either for obtunding sensitive dentin or for the purpose of removing the pulp, and to

have patients report at regular intervals during the year any complications that might arise.

Thus far the only unpleasant features we have had to contend with were excessive hemorrhage, and very often secondary hemorrhage after removal of the pulp. If it is true that cocain produces its effect largely on account of its being a protoplasm poison, it would be a wise plan to limit the dosage and its action as much as possible. The more profound the paralysis the greater will be the reaction, and the more serious will be the danger from secondary hemorrhage and of hyperemia in case the pulp is not removed. The reason for this seems to be very clear, because the more paralysis we have in the blood vessels the longer time will it take for them to regain their normal tonicity. I should not fill any root canals at the same sitting after extirpation of the pulp, especially under pressure anesthesia. Thoroughly cleanse the root canals with dioxogen or other disinfectant, and leave a dressing of dry absorbent cotton for at least twenty-four hours to take care of any secondary hemorrhage or an accumulation of serum.

There is another source from which trouble may come, and that is infection. To guard against this contingency extreme care ought to be exercised to see that the field of operation, solutions used, as well as instruments, are thoroughly disinfected, or if need be, sterilized before each operation. On account of the extreme pressure used, some of the cocain solution is apt to be forced into the apical region, and if there be any septic matter at the point of application or in the tooth tissues it will certainly be carried with the anesthetic into the apical space and there set up an active inflammation.

It might be well to call to your mind that we are dealing with tissues whose environment is such as to allow scarcely any room for expansion, so in case of hyperemia or active inflammation the symptoms are always marked and the prognosis in many cases is unfavorable. The old saying that "an ounce of prevention is worth a pound of cure" applies here with more force than in any other part of our work.

The following are some of the more important suggestions which, if rigidly adhered to, would tend to limit very materially the number of failures after pressure anesthesia: 1. A strict observance of all principles governing aseptic operations, and by this I mean that in every case the rubber dam ought to be applied and the cavity or

tooth thoroughly dried and disinfected by the best possible means. All instruments should be sterilized and a fresh, sterile solution of cocain used in each case.

2. No more of the anesthetic should be used than is necessary to make the operation painless. To repeat, the more profound the paralysis the more prolonged will be the time for recovery of the cells thus affected. Microorganisms which have gained entrance either through the solution used or through the blood and lymph channels may gain a foothold before the cells of the tissue have fully recovered. My first clinical experience with this method happened to be an easily accessible cavity, and on this account, perhaps, the time limit was greatly exceeded—so much so that there seemed to be absolutely no feeling in the cavity or tooth for at least thirty minutes after the cocain was applied. This is a point that ought to be closely watched. The cavity or the pulp should be tested at short intervals to determine whether sensation is lost or not. In case of the pulp that test can be applied only when there is an exposure. Thus far my experience would suggest that the maximum time limit be fixed at one minute when there is no leakage.

3. Either a weak solution or a limited amount of a stronger one is another principle that it would be well to bear in mind. By properly controlling the pressure we can, to a certain extent at least, limit the amount of the local anesthetic used. Just as in the administration of general anesthetics, pleasing results can be obtained by its careful and limited use that cannot be obtained in any other way. Cocain readily undergoes chemical changes in its composition so that solutions for use should be made fresh as required. Its anesthetic properties are destroyed by boiling, views to the contrary notwithstanding.

Inasmuch as cocain produces its characteristic effects by paralyzing the nerve endings, the less constriction there is produced in the blood vessels the better, because the reaction depends very largely upon the amount of disturbance there has been produced in the blood supply. For this reason I cannot see what particular advantage would be gained in the end by using a special astringent, such as adrenalin chlorid. So powerful an astringent as this makes a bloodless operation a possibility, but it also greatly increases the dangers from secondary hemorrhage and not infrequently other serious complications. Two cases at least that I have in mind, both

operations upon the nose and in which a combination of cocain and adrenalin chlorid was used, have clearly demonstrated to my mind that there is more truth than fiction in the above statement. In the one case there was an unusual amount of trouble from secondary hemorrhage. In the other erysipelas was the complication, undoubtedly brought about through the profound debility produced in the tissue cells, thus rendering the parts more susceptible to infection.

—*Register.*

RELATIVE SAFETY OF ETHER AND CHLOROFORM.

Nothing better illustrates the inexactitude of medicine as a science than the fact that after more than fifty years of practical clinical experience, as well as of laboratory experimentation, professional opinion is still divided as to the relative safety—each being properly administered—of ether and chloroform, the two anesthetics earliest employed in general surgery and still more largely used for general anesthetic purposes than any or all others of the anesthetic group. The bias in favor of either one or the other is not confined to individual practitioners, but varies with sections and nationalities. In England and Continental Europe chloroform is as a rule the agent of choice and hence is far more frequently administered than ether. The reverse is true of the United States, although in the Southern States of the Union chloroform is much more in favor than in the North.

The unreliability of statistics is proverbial, and the data bearing upon the question at issue vary greatly as to relative ratio; but all comparative tabulations of anesthetics with ether and chloroform show a great preponderance of fatalities from the latter agent. One death in fifteen thousand anesthetics with ether and one in three thousand with chloroform, a ratio of one to five, has been claimed and is probably approximately correct. Such results are of course strong *prima facie* evidence that chloroform is the more dangerous agent.

While in view of data so uniformly unfavorable to chloroform the conclusion that in lethal power it is far more potent than ether cannot be avoided, the advocates of chloroform regard that fact not as contraindicating its use as an anesthetic, but simply as demonstrating the necessity for its more careful administration. In this conclusion they were greatly fortified by the findings of the

Hyderabad Commission, which after elaborately conducted laboratory experimentation arrived at the conclusion that chloroform has no direct action on the heart, and that narcosis of the vasomotor center, with consequent dilatation of the capillary blood-vessels and fall in blood-pressure, which are the normal results of anesthesia with chloroform, really safeguard the heart by facilitating the passage of blood from the arterial to the venous system, thus lessening the work the heart is normally called upon to perform. Hence, that so far as the heart is concerned chloroform is a perfectly safe anesthetic, and that when it kills death results primarily and chiefly through respiratory paralysis, the heart usually continuing to beat for several minutes after respiration ceases. These conclusions, based as they were upon laboratory experiments with monkeys and other lower animals and not upon clinical experience with man, have never met with general acceptance in this country. Professor H. C. Wood affirms, as the result of his own experimental observation, that it has been completely demonstrated that chloroform is a direct paralyzant of the heart muscle or its contained ganglia, and that the fall of blood-pressure which occurs in chloroformization is in great part due to this direct depression of the heart.

The results of recent experimental research regarding the relative safety of ether and chloroform have been reviewed at length by Professor A. Jaquet of Basle in the *Semaine Médicale* of December 7, 1904. In this review over forty authorities are quoted. For lack of space the details of their experimental work cannot here be given, but the conclusions arrived at by Professor Jaquet are to the effect that "while the mode of production of anesthesia is identical with ether and chloroform, the two have secondary actions influencing differently the organism and playing an important role in the preference to be accorded to the one or the other. Chloroform greatly depresses the heart as well as the respiration and also lowers blood-pressure; ether, on the contrary, does not weaken those functions until an extreme toxic dose has been administered. Nerve tissue exposed to contact with chloroform vapor is killed, while ether vapor of the same relative dilution produces only a temporary functional paralysis. The zone of manageability is much more extended with ether than with chloroform, and hence accidents from an excess of ether are less to be

feared than from an excess of chloroform. Prolonged anesthesia from ether is better supported than from chloroform. The latter produces parenchymatous degeneration of all the organs, and such a degeneracy affecting an organ already enfeebled may prove fatal to the patient; while from ether there are no appreciable histological lesions."

In view of these considerations Professor Jaquet's final conclusions are as follows: "Ether has a series of incontestable advantages over chloroform which justify the increasing favor it enjoys as an anesthetic in surgical operations. Ether is less dangerous than chloroform, and it is possible to considerably reduce the inconveniences resulting from etherization by a rational mode of administration. Pulmonary affections following etherization are not so much the fault of ether as of him by whom the drug is administered." These remarks are undoubtedly substantially correct. Ether of course has its disadvantages, chief among which is the irritant effect of its vapor upon the mucous lining of the respiratory tract, this effect constituting a strong contraindication as to its employment in acute inflammatory conditions of the larynx, trachea, bronchi, or lung parenchyma, and a cogent reason for exercising the utmost care in its administration even to healthy subjects.

Because safer than chloroform it is too often given by un instructed practitioners, both medical and dental, even more recklessly and indiscriminately than that agent; whereas to secure the least harmful results its administration should be conducted with at least equal care. When a reasonably healthy patient, without inflammatory or other pathological conditions of the respiratory tract, shows marked symptoms of respiratory embarrassment in the early stages of etherization, the complication in a vast majority of instances is directly attributable to a faulty method of administration. Usually the error is that the inhaler, whatever its form, is overcharged with the drug, so that far more ether is vaporized than can be commingled with air to the degree of dilution necessary to prevent or minimize irritant effects. The complete diffusion of ether vapor by the inflowing air currents is rendered the more difficult by its greater relative density, it being more than twice as heavy as atmospheric air, so that instead of immediately forming an intimately blended melange they pass into the lung

tract, partially at least, in distinct streams, the comparatively undiluted ether being thus brought in direct contact with those delicate vascular surfaces through which it must pass into the circulation.

To administer any anesthetic with the maximum of safety for the patient requires a mastery of technique and a command of resources to be obtained only by careful study and long observation and experience, and the fact is now generally recognized that the skill of the anesthetist is second in importance only to that of the surgeon.

It has been affirmed, and not without a substantial basis of truth, that in a majority of operations the danger to life is quite as much from the anesthetic as from the surgeon's knife. As a rule death is charged against the anesthetic only when immediately fatal results follow its administration; but equally chargeable are the far more numerous cases in which within a few hours or days after operations not intrinsically serious patients succumb to the secondary effects of the drug.

Under proper safeguards ether narcosis effected by inhalation should result in death almost as infrequently as from intoxication with alcohol by imbibition. The two agents are as closely related in their physiological effects as they are in their chemical constitution. Both, if undiluted, are tissue irritants, the one to the lung tissue when inhaled, the other to the stomach when imbibed, the secondary effects upon the nervous system being practically identical. With either agent insufficient dilution is a blunder for which penalties must be paid. For the faulty administration of either ether or chloroform the penalty paid by the patient far too frequently is death.—Editorial in *Brief*.

INJECTION OF OSMIC ACID FOR TIC DOULOUREUX.—The case of a woman seventy-one years of age, who presented an intense tic involving the right side of the face, is reported by J. R. Eastman (*Jour. Am. Med. Assn.*). The attacks had become gradually worse during twenty years, and the usual remedies had been found ineffectual. A two per cent solution of osmic acid was then injected into the supraorbital, infraorbital, and dental nerves, in the manner recommended by Dr. J. B. Murphy. Ten drops of the solution were injected into each branch, and two to three drops forced into the perineural fat around the nerves at their foramina of exit.

The Dental Digest.

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Where All Communications Should be Addressed.

Editorial.

DENTISTS AS SPEAKERS.

This being the season for state meetings, a few words on this subject may not be inopportune. So many of the papers which are read before dental societies are technical in character that it is imperative the speaker and those who take part in the discussion make themselves heard and understood. Dentists as a class perhaps do little public speaking, especially not in halls as large as those used by the average state society, but there are few men who cannot attain a reasonable degree of ability in this line with a little practice. The acoustic properties of most halls, even in the large cities, are anything but perfect, and when the meetings are held in the hotel parlors or ballroom, as is frequently the case in the smaller towns, those speaking are placed at a great disadvantage. Consequently it is all the more necessary that dentists should perfect themselves in this respect. The basis of speech should be a medium pitch, as from it one may ascend or descend according to requirements. The essayist will be much better understood and not tire himself nearly so much if he uses chest instead of throat tones. Beecher once said—"What a speaker most needs is to strengthen his ordinary conversational voice, without giving it a hard firm quality, that is, without destroying its flexibility and power of adaptation to every mood." Sense should never be sacrificed to sound and a speaker should never use more force than is necessary. When requested to speak louder, as frequently happens, he should not raise the pitch of his voice, but simply make a slight increase of volume on the same key. Some men through nervousness speak too rapidly or mumble their words, the power of easy, clear enunciation seemingly having been

taken away by their embarrassment. The result is that the audience cannot hear what is being said and so becomes restive, the more impatient or interested individuals call to the essayist to speak louder, and all these things merely increase his stage fright and make a bad matter worse. The real secret of effective delivery lies in the ability of the speaker to impress himself with his subject, and if a man is full of his theme and is convinced of its importance, he will not only lose all self-consciousness, but the audience will unconsciously catch his inspiration. Another manifestation of nervousness, especially among the younger members of the profession or those unaccustomed to speaking, is diffuseness of utterance, as the young men feel it necessary to describe ordinary things in an extraordinary manner. The too free use of words leads to a quickening of speech, and this frequently leads to inaccuracy of expression. The speaker's only object should be to make himself understood, and the fewer words he can use in so doing the more effective will be his discourse and the closer will be the attention accorded him.

PHYSICAL HYGIENE AND THE BREATH.

On another page will be found an article by Dr. R. B. Tuller, on the subject of the breath. Although written in his well-known humorous style, it is a case of many a true word being spoken in jest. There can be no question that dentists of all men should have as clean breaths as possible, for no other class comes in such close physical contact with the public or for such long periods. It is nevertheless unfortunately true that the proportion of bad breaths in the profession is not only much greater than it should be, but is greater than that of any other class of equal refinement. The cause can be attributed to the excessive use of tobacco and to stomach disorders, both of which are caused by the indoor life led by the average practitioner. It is a well-known fact that men of sedentary habits use tobacco to a far greater extent than those who live more out of doors, especially in the higher walks of life. Many men do not want to scent up their offices with tobacco smoke, so they chew while at work in the laboratory, and after a man has been chewing tobacco for even a few minutes he can't dispel the odor by merely rinsing out his mouth and brushing his

teeth. A large number go direct to the patient after smoking or chewing without making any effort to remove the traces. The majority of dental patients are women, and as they don't use tobacco themselves they abhor the smell of it on the breath of another. The aroma of a lighted cigar and the nauseating reek of stale tobacco on the breath are two entirely different things, but this fact is frequently overlooked by the user. Properly dentists should not use tobacco in any form, but if they must do so it should always be after hours. No physician who valued the good opinion of his clientele would go to his patients with the stink of tobacco on him, and for his own sake and that of his profession no dentist can afford to do so. As regards the other exciting cause of disagreeable breaths, no other class of professional men is so confined as are dentists, and the lack of exercise, fresh air and sunshine naturally brings on indigestion, with its accompaniment of coated tongues and disordered saliva. Dentists owe it not only to their patients but to their general health to keep the digestive functions in perfect working order, and this can easily be accomplished by systematic exercise in the open air and by carefully selected diet. It should be superfluous to offer any advice on the care and cleanliness of the teeth to men who earn their livelihood thereby, but according to the testimony of those who have investigated the subject it is unfortunately necessary. One of the complicating features of the situation is that the owner of a bad breath frequently is unable to detect it, and because of mistaken kindness on the part of his friends may even be unaware of its existence. Nothing can be more offensive to the esthetic sense than a foul breath, and yet patients are expected to endure same for hours at a time. It takes an extraordinary amount of ability to overcome the handicap of a bad breath, and no doubt the loss of many a patient may be traced to it.

Notices.

COLUMBUS (O.) DENTAL SOCIETY.

The Columbus (O.) Dental Society held its tenth annual meeting April 25, 1905, and elected the following officers: President, Harry Cope; Vice-president, E. M. Fisher; Secretary, G. Hayden; Treasurer, F. R. Chapman.

EVANSVILLE (IND.) DENTAL SOCIETY.

The Evansville (Ind.) Dental Society was organized April 12, 1905, and the following officers were elected: President, M. M. Haas; Vice-president, A. R. Reitz; Secretary, L. C. Smith; Treasurer, H. M. Hooker.

JANESVILLE (WIS.) DENTAL SOCIETY.

At the annual meeting of the Janesville (Wis.) Dental Society, held April 15, 1905, the following officers were elected: President, I. H. Holsapple; Vice-president, J. E. Baker; Secretary and Treasurer, F. G. Wolcott.

OHIO VALLEY DENTAL SOCIETY.

The Ohio Valley Dental Society held its annual meeting at Steubenville, O., April 7, 1905, and elected the following officers: President, E. C. Chandler, Steubenville; Vice-president, J. W. Storer, Wheeling; Secretary, Wm. Shannon, Steubenville; Treasurer, W. R. Allison, Steubenville.

SOUTHWESTERN MICHIGAN DENTAL ASSOCIATION.

At a meeting of the Southwestern Michigan Dental Association, held in Kalamazoo April 10, 1905, the following officers were elected: President, J. H. Palin, Grand Rapids; Vice-president, F. C. Sizelan, Kalamazoo; Secretary and Treasurer, C. W. Johnson, Lawton.

WESTERN MASSACHUSETTS DENTAL SOCIETY.

The Western Massachusetts Dental Society held its annual meeting April 10, 1905, and elected the following officers: Secretary, E. A. Schillinger, Lee; Treasurer, W. H. Fallon, Pittsfield; Executive Committee, A. W. Gabeler and M. J. Fallon, Pittsfield, and A. S. Johnson, Great Barrington; Councilor to society for five years, M. W. Flynn, Pittsfield.

THIRD DISTRICT DENTAL SOCIETY (NEW YORK).

The Third District Dental Society of New York met at Albany April 20, 1905, and elected the following officers: President, J. L. Appleton, Albany; Vice-president, W. E. McCarthy, Troy; Secretary, C. E. Allen, Albany; Treasurer, P. S. Oakley, Troy; Correspondent, F. LeGrand Ames, Albany; Editor, L. S. Blatner, Albany.

EIGHTH DISTRICT DENTAL SOCIETY (NEW YORK).

The Eighth District Dental Society (New York) held its thirty-seventh annual meeting at Buffalo April 25, 1905, and elected the following officers: President, G. W. Pringle, Niagara Falls; Vice-president, L. W. Robinson, Buffalo; Recording Secretary, Emanuel Muntz, Buffalo; Corresponding Secretary, D. H. Young, Attica; Treasurer, Louis Meisburger, Buffalo; Librarian, S. A. Freeman, Buffalo; Censors, H. J. Burkhart, A. E. Preston, C. W. Stainton, J. W. Beach, Fred Dayment.

FIFTH DISTRICT DENTAL SOCIETY (NEW YORK).

The Fifth District Dental Society (New York) held a meeting at Syracuse April 12, 1905, and elected the following officers: President, G. A. Potter, Cape Vincent; Vice-president, E. A. Smith, Rome; Secretary, C. A. Sayres, Watertown; Corresponding Secretary, W. H. Leak, Watertown; Treasurer, I. C. Curtis, Fulton.

INDIAN TERRITORY DENTAL ASSOCIATION.

The Indian Territory Dental Association at its meeting April 28, 1905, elected the following officers for the ensuing year: President, E. A. Bonnell, Muskogee; Vice-president, S. A. Long, South McAlester; Secretary, H. A. Stiegel, Jr., Muskogee; Treasurer, A. W. Walter, Checotah. The next meeting will be held at Ardmore.

VALLEY DISTRICT (MASS.) DENTAL SOCIETY.

The Valley District (Mass.) Dental Society held its annual meeting April 17, 1905, and elected the following officers: Secretary, C. W. Hale, Springfield; Treasurer, C. S. Hurlbut, Springfield; Executive Committee, A. G. Doane, Northfield; F. H. Saunders, Westfield; H. K. Fison, Springfield; Councilor to society for five years, G. A. Maxfield.

ALUMNI ASSOCIATION VANDERBILT UNIVERSITY DENTAL DEPARTMENT.

The Vanderbilt University Dental Department Alumni met April 6, 1905, and organized, electing the following officers: President, W. C. Gillespie; 1st Vice-president, Geo. S. Vann; 2d Vice-president, R. B. Lees; Secretary, J. T. Meadors; Corresponding Secretary, Harry Holder; Treasurer, W. F. Buckner.

FOURTH DISTRICT DENTAL SOCIETY (NEW YORK).

The Fourth District Dental Society (New York) met at Schenectady April 20, 1905, and elected the following officers: President, E. M. Foote, Whitehall; Vice-president, E. R. Grinard, Schenectady; Secretary, Frank Grennan, Schenectady; Treasurer, E. Doolittle, Saratoga; Corresponding Secretary, R. H. Whitner, Schenectady; Executive Committee, Drs. Rose of Schenectady, Pinerman of Fort Plain and George Brown of Glens Falls.

SOUTHEASTERN DISTRICT OF THE MASSACHUSETTS DENTAL SOCIETY.

The annual meeting of the Southeastern District of the Massachusetts Dental Society was held April 13, 1905, and the following officers were elected: Secretary, W. E. Beale, Brockton; Treasurer, A. F. Wyman, New Bedford; Executive Committee, H. H. Filoon, C. Ernest Perkins, G. A. Thatcher, all of Brockton; Councilor to parent society for five years, C. I. Gould, North Attleboro.

FLORIDA STATE BOARD OF DENTAL EXAMINERS.

The Florida State Board of Dental Examiners will meet at Seabreeze, May 29, 1905, at 10 o'clock, for the purpose of examining applicants to practice dentistry. Only those who have diplomas from reputable dental colleges are eligible for examination.

W. G. MASON, Sec'y, Tampa.

OHIO STATE BOARD OF DENTAL EXAMINERS.

The regular semi-annual meeting of the Ohio State Board of Dental Examiners will be held in Columbus, June 27-29, 1905, inclusive, at the Hartman Hotel. Applications for examination should be filed with the secretary by June 17. For further information address

H. C. BROWN, Sec'y, 185 E. State St., Columbus.

LOUISIANA STATE DENTAL SOCIETY.

The regular annual meeting of the Louisiana State Dental Society will be held at the lecture rooms of the New Orleans College of Dentistry May 4-6, 1905. There will be several papers and interesting clinics offered. Program will be mailed later. A cordial invitation is extended to the profession to attend and co-operate with us.

A. L. PLOUGH, Sec'y, New Orleans.

MINNESOTA STATE BOARD OF DENTAL EXAMINERS.

The Minnesota State Board of Dental Examiners will hold a special examination on June 5-7, 1905, at the Dental Department of the State University. The secretary will be at the dental department on the afternoon of June 3 to receive applications. All applications must be in by 5 p. m. of that date. Application blanks will be furnished upon request by the secretary.

F. S. JAMES, Sec'y, Winona.

FEDERATION DENTAIRE INTERNATIONALE.

The next annual meeting of the Executive Council of the Federation Dentaire Internationale will convene in Hanover, Germany, August 7, 1905, immediately following the annual meeting of the Central-Verein Deutscher Zahnärzte. Announcement of the program for the meeting will shortly be made through the dental journals and through the official bulletin of the Federation.

EDWARD C. KIRK, Secretary-General.

CENTRAL PENNSYLVANIA DENTAL SOCIETY.

At the semi-annual meeting of the Central Pennsylvania Dental Society, held at Huntingdon April 4, 1905, the following officers were elected: President, H. E. Crumbaker, Altoona; Vice-president, C. W. Brown, Altoona; Secretary, Julia Wood, Altoona; Treasurer, J. C. Nugent, Altoona; Board of Censors, C. B. Miley, Huntingdon; Crawford Boyles, Altoona; Dr. Wilson, Huntingdon; Executive Council, Dr. Evans, Barnesboro; N. T. Dill, Huntingdon; T. Stine, Tyrone; W. M. Bolger, Martinsburg; J. W. Carter, Altoona.

MISSISSIPPI STATE DENTAL ASSOCIATION.

The twelfth annual meeting of the Mississippi State Dental Association was held April 23, 1905, and the following officers were elected: President, A. B. Kelly, Yazoo City; 1st Vice-president, L. B. McLaurin, Natchez; 2d Vice-president, J. F. Scott, Summit; Secretary, E. Hood, Tupelo; Corresponding Secretary, W. H. Reaben, McComb; Treasurer, C. C. Crowder, Kosciusko; Executive Committee, E. D. Hood, Tupelo, W. O. Talbot, Biloxi, C. F. Boger, Natchez.

MASSACHUSETTS BOARD OF REGISTRATION IN DENTISTRY.

A meeting of the Massachusetts Board of Registration in Dentistry for the examination of candidates will be held in Boston June 21-23, 1905. All applications, together with fee of \$20, if first examination, must be filed with the secretary on or before June 14, as no application for this meeting will be received after that date. Hereafter candidates for second and subsequent examinations will be required to fill out an application blank and forward it to the secretary. The fee for third and subsequent examinations is \$5.00.

G. E. MITCHELL, *Secretary*.
25 Merrimack St., Haverhill.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates for license to practice dentistry in Wisconsin will be held in Milwaukee June 26, 1905, at the Wisconsin College of Physicians and Surgeons, Corner 4th St. and Reservoir Av. Application must be made to the secretary fifteen days before the examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry consecutively for four years, or an apprentice to a dentist engaged in the reputable practice of dentistry for five years. For further particulars apply to

J. J. WRIGHT, Sec'y, 1218 Wells Bldg., Milwaukee.

KENTUCKY STATE BOARD OF DENTAL EXAMINERS.

The Kentucky State Board of Dental Examiners will meet for examination of candidates at Louisville on the 6th of June, 1905, at Gaulbert Bldg., commencing at 9 a. m. Candidates will be examined in the following subjects: Anatomy, physiology, materia medica, pathology, histology, operative dentistry, oral surgery, chemistry, metallurgy and prosthetic dentistry. A general average of 75 per cent is required. Candidates must come prepared with instruments (except engine) and material (gold) to fill at least one tooth; also a metal case of not less than four teeth (bridge or plate) invested and ready to solder before the board. Candidates will be required to certify that all work on metal case was done by them. Application for examination must be made on blanks furnished by secretary, and must be accompanied by a fee of \$20.00. Candidates must be graduates of reputable dental colleges.

C. R. SHACKLETTE, Sec'y, 628 Fourth Av., Louisville.

VERMONT STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Vermont State Board of Dental Examiners for the examination of candidates to practice dentistry will be held at Montpelier July 5-7, 1905, commencing at 2 p. m., July 5. Headquarters will be at the Pavilion Hotel. All applications, together with the fee of \$25.00, must be in the hands of the secretary not later than June 25. For further information apply to

GEO. F. CHENEY, Secretary,
St. Johnsbury.

UNION MEETING OF THE DISTRICT OF COLUMBIA DENTAL SOCIETY AND THE MARYLAND STATE DENTAL ASSOCIATION.

The next union meeting of the District of Columbia Dental Society and the Maryland Dental Association will be held in Baltimore May 25-27, 1905, at the dental department of the Baltimore Medical College. An interesting program has been prepared and a cordial invitation to be with us is extended to all ethical members of the profession.

F. F. DREW, Sec'y, Baltimore.

NORTHERN OHIO DENTAL ASSOCIATION.

The forty-sixth annual meeting of the Northern Ohio Dental Association will be held June 6-8, 1905, at Gray's Armory, Cleveland. This is not only one of the oldest, but is one of the very best attended meetings in the country. This year the program is one of unusual strength and interest. The leading subjects for consideration are: 1. Humanitarian Methods. 2. Mistakes. 3. Prophylaxis.

Under the first are considered High Pressure Anesthesia, by Dr. C. G. Myers of Cleveland, and High Pressure Anesthesia as Compared with Other Pain-Preventing Methods, by Dr. D. H. Zeigler of Cleveland. Essays under the second group include the Mistakes of the Country Dentists, by Dr. R. D. Wallace, Scio, Ohio; Mistakes of the City Dentist, by Dr. F. J. Spargur, Cleveland; and Mistakes in Ethics, by Prof. S. H. Guilford of Philadelphia. The third includes the essays—Two Sources of Tooth Life and Their Relative Importance, by Dr. D. D. Smith of Philadelphia, and Diseases of the Peridental Membrane and Treatment, by Dr. J. V. Stahl of Wooster, Ohio. The essayists and those who open discussion upon the various papers have been selected for their particular fitness to handle the subjects assigned to them.

Under Mistakes in Ethics Dr. Guilford will point out, as only he can, some mistakes that are being made by the profession in the relation of its members to each other, together with the mistakes made in treatment of patients and the public. Great good is expected to result from the presentation of this paper and the discussions that follow. Many false impressions have existed in the past and still exist as to the duties we owe to each other, our patients and the public, and it is expected that the three papers on mistakes will do much to correct this. Dr. Smith's paper bears upon that all important subject, prophylaxis. He will bring a patient with him showing results accom-

plished by his method of procedure, and will illuminate his paper with models and instruments.

Throughout the entire program much attention will be given to the study of humanitarian methods. (Methods which make it possible to perform dental operations free from pain.)

The two papers, Application of High Pressure Anesthesia, and High Pressure Anesthesia as Compared with Other Pain-Preventing Methods, and the discussions to follow, will set forth all that is known of importance in this connection.

There will be about fifty clinics, selected and arranged to give the knowledge seeking dentists the best post-graduate course that can possibly be obtained in a three days' meeting. One session will be devoted to the study of manufacturers' exhibits. The exhibits this year are to be one of the interesting features of the meeting, and the committee has been promised one of the largest exhibits shown in the country.

All communications pertaining to clinics or exhibits should be addressed to the Corresponding Secretary, Dr. W. G. Ebersole, 800 Schofield Bldg., Cleveland.

A special rate of a fare and a third has been granted on the certificate plan by the Central Passenger Association.

The committee extends a most cordial invitation to the members of the profession to attend.

W. G. EBERSOLE,	} Executive Committee.
GEO. H. WILSON,	
VARNEY E. BARNES,	

NATIONAL DENTAL ASSOCIATION.

The ninth annual session of the National Dental Association will be held in Buffalo July 25-28, 1905, inclusive. The Hotel Iroquois has been selected by the local committee of arrangements as headquarters, where all general sessions of the Association and of the Sections will be held. The clinics will be held at the rooms of the Dental Department, University of Buffalo.

Rates at the Hotel Iroquois are, single room per day, \$1.50, \$2 and \$2.50; room for two persons, \$3 and 4; single room with bath, \$3 and \$3.50; room with bath for two persons, \$5, \$6, \$7 and \$7.50; all rooms on the European plan.

The usual railroad rate of one and one-third fare for the round trip, certificate plan, has been arranged for by the executive committee. All pay full fare going, taking the proper certificate therefor from the ticket agent, which when properly vised at the meeting entitles the holder to return for one-third the regular rate. Tickets going may be purchased from July 20-26, and are good returning to and including August 2.

Both the general officers and those of the Sections have been working hard to provide an interesting and instructive program, and a large attendance is expected.

A. H. PECK, Recording Secretary, Chicago.

MISSOURI STATE DENTAL ASSOCIATION.

PAPERS.

Partial Program of the Missouri State Dental Association Meeting, to Be Held in St. Louis, May 24-26, 1905.

Dr. J. H. Kennerly, St. Louis—President's Address.

Dr. W. A. Thornton, Chatham, Ontario—Bridgework. The Best Means of Avoiding an Undesirable Display of Gold.

Dr. John Q. Byram, Indianapolis—Some Phenomena Observed in Fusing Porcelain.

Dr. J. D. Patterson, Kansas City—Predisposition.

Dr. Edmund Noyes, Chicago—The Administration of Anesthetics by Dentists.

Dr. F. E. Cheeseman, Chicago—The Mistake of the Past in Porcelain Inlays.

Dr. H. W. Loeb, St. Louis—Demonstration of the Relations of the Antrum of Highmore.

REPORT OF COMMITTEES.

CLINICS.

Dr. W. A. Thornton, Chatham, Ontario—Table Clinic, Bridgework.

Dr. Wm. Conrad, St. Louis—Dental Hygiene.

Dr. H. Prinz, St. Louis—Pyorrhea.

Dr. O. J. Fruth, St. Louis—Gold Inlays and Burnished Tips.

Dr. W. L. Reed, Mexico, Mo.—Bandless Gold Crowns.

Dr. W. M. Bourn, St. Joseph, Mo.—Subject to be announced.

Dr. L. C. Frazier, Palmyra, Mo.—Subject to be announced.

Dr. J. F. Wallace, Canton, Mo.—Proximo-Occlusal Cavity in Incisor.

Dr. W. J. Lark, St. Louis—Pressure Anesthesia.

Dr. R. M. Burgess, Paris, Mo.—Subject to be announced.

Dr. Chas. D. Weakley, Lawson, Mo.—Gutta-Percha Denture.

Dr. Oscar Hammer, St. Louis—Subject to be announced.

Dr. D. J. McMillen, Kansas City—Bandless Molar Crowns.

Dr. E. P. Dameron, St. Louis—Table Clinic, Non-cohesive Gold.

Dr. J. D. Patterson, Kansas City—The Perfect Adjustment of a Logan Crown.

Dr. T. E. Purcell, Kansas City—Root-Canal Fillings.

Dr. U. G. Houghland, Kansas City—Table Clinics, Seamless Crowns in Bridgework.

Dr. W. M. Carter, Sedalia, Mo.—Some Simple Ways of Lessening Pain.

Dr. T. L. Pepperling, St. Louis—Gold Fillings.

Dr. A. H. Brown, Hamilton, Mo.—Table Clinic, Preparation of Cavity and Inserting Gold Filling in Artificial Teeth.

Dr. F. D. Worthley, Kansas City—Desensitizing Dentin.

Dr. H. H. Sullivan, Kansas City—Table Clinic.

Dr. L. A. Young, St. Louis—Pressure Anesthesia, Sealing Root-Canal with Oleo-Percha.

Dr. E. Burgstresser, St. Louis—Hollow Gold Inlay.
Dr. J. Robt. Megraw, Fayette, Mo.—Drilling Cavities in Porcelain Teeth.
Dr. Bert G. Price, Oregon, Mo.—Gutta-Percha Base Plates.
Dr. H. I. Bragg, Columbia, Mo.—Retaining Rubber Dam Without the Use of Clamps.

Dr. W. F. Lawrence, St. Louis—Porcelain Crowns.
Dr. G. B. Winters, St. Louis—Extraction with Nitrous Oxid.
Dr. B. E. Lischer, St. Louis—Orthodontia.
Dr. J. D. White, St. Louis—Porcelain Stains.
Dr. A. J. Prosser, St. Louis—A Practical Clinic.
Dr. J. F. Austin, St. Louis—A Contour Gold Filling.
Dr. O'Dench, St. Louis—Regulating Appliances.
Dr. O. H. Manhard, St. Louis—Retention of Loose Teeth.
Dr. F. E. Cheeseman, Chicago—Porcelain Restoration.
Dr. T. E. Turner, St. Louis—Porcelain Inlay.
Dr. C. D. Inkin, St. Louis—Orthodontia.
Dr. W. A. Roddy, St. Louis—Replacing Porcelain Facing with an Inlay.
Dr. F. K. Ream, St. Louis—Extracting with Nitrous Oxid.
Dr. Berry, St. Louis—Subject to be announced.
Dr. De Courcey Lindsley, St. Louis—Suggestive Anesthesia.
Dr. E. Burgstresser, St. Louis—Hollow Gold Inlay.
Dr. R. O. Butts, St. Louis—Contour Gold Filling.
Dr. H. H. Hill, St. Louis—Demonstrating a Method of Making an Open-Faced Gold Crown.

Dr. John G. Harper, St. Louis—Setting a Logan Crown.
Dr. F. F. Fletcher, St. Louis—Will Demonstrate the Necessity for Using Different Mallets on the Same Filling.

Dr. F. E. Roach, Chicago—Method of Attachment for Partial Plates and Removable Bridges.

Dr. G. W. Musgrave, Ash Grove, Mo.—Table Clinic, How to True Carborundum Wheels.

Dr. W. M. Berry, St. Louis—Table Clinic on Prosthetic Work.

Dr. D. O. M. LeCron, St. Louis—Porcelain Clinic.

The complete program is now in the hands of the printers and will be ready for mailing in a few days. Headquarters will be at the Hotel Jefferson, European plan only, and the rates are—Room without bath, \$1.50 and up; two in room without bath, \$1 and up, each; room with bath, \$2.50 and up; two in room with bath, \$1.50 and up, each. A rate of one and one-third fare on the certificate plan has been secured on all railroads. The profession is cordially invited to attend.

SAM T. BASSETT, Sec'y, St. Louis.

FUSING OF PLATINUM SOLDER.—The fusing of platinum solder is made very simple by using a cylinder of N_2O instead of the bellows or compressed air. Attach it to the air-nozzle of the blowpipe and tooth or a small piece of pure platinum can be fused in a few seconds.—R. J. HUSBAND, *Dominion*.

News Summary.

CHARLES A. WILLARD, a dentist of Baldwinsville, N. Y., died April 10, 1905.
J. F. FRISTO, 60 years old, a dentist of Nameless, Va., died April 27, 1905.
BENJAMIN F. SLEEPER, 51 years old, a dentist of Boston, died April 2, 1905.
ANSON A. STONE, a dentist of Chautauque County, N. Y., died April 13, 1905.

HENRY A. DOWNING, 68 years old, a dentist of Cincinnati, died April 13, 1905.

GEORGE B. BATES, a dentist of Lowell, Mass., 42 years old, died April 22, 1905.

A. B. BOYD, a dentist of Carlisle, Ky., died April 22, 1905, of nervous prostration.

CHARLES M. HITCHCOCK, 55 years old, a dentist of Utica, N. Y., died April 8, 1905.

R. G. PALMER, 26 years old, a dentist of LeSueur Center, Minn., died April 10, 1905.

E. J. WAYE, 76 years old, a dentist of Cleveland, died April 3, 1905, from paralysis.

J. N. WARNER, a dentist of Wilkesbarre, Pa., died April 28, 1905, from pneumonia.

ISAAC N. MERRITT, 49 years old, a dentist of Battle Creek, Mich., died April 18, 1905.

ROY MOORE, 27 years old, a dentist of Marysville, Kan., died of consumption April 17, 1905.

J. H. TAYLOR, a dentist of Owensboro, Ky., 59 years old, died after a long illness April 4, 1905.

LEONARD F. DUNN, 75 years of age, a dentist of Oneida, N. Y., died April 12, 1905, of diabetes.

DR. GILMOUR, 25 years old, a dentist of New Hamburg, Ont., committed suicide April 10, 1905.

FRANCIS A. BRAUNES, 55 years old, a dentist of New York City, committed suicide April 25, 1905.

ERNEST SEEGER, 51 years of age, a dentist at Manitowoc, Wis., shot himself to death April 17, 1905.

W. M. HAMMOND, 89 years old, formerly a dentist of Kansas City, died at Rosedale, Mo., April 27, 1905.

ROBERT W. CANTWELL, 62 years of age, a dentist of New London, Conn., died April 13, 1905, of heart disease.

MARTIN V. RUSSELL, a dentist of Los Angeles, Cal., was killed by a street car at Santa Monica April 15, 1905.

J. F. STEPHENSON, 40 years old, a dentist of Sunnyside, Wash., died of consumption April 16, 1905, in Phoenix, Ariz.

J. J. LAVIN, 29 years of age, a dentist of Hartford, Conn., committed suicide in a New York hotel, March 17, 1905.

FRANCIS A. CUMMINS, a dentist of Jersey City, died April 30, 1905, in Washington, N. J., as a result of injuries received a year ago.

TOOTHACHE DUE TO PREGNANCY OR DEBILITY.—Toothache due to pregnancy or debility should be treated with maximum doses of calcium hypophosphite.—*Medical Progress*.

DIVORCES.—James E. Rothenbush, a dentist at Hamilton, O., was sued for divorce by his wife on April 10.—Thomas J. Borland, a dentist in Milwaukee, was sued for divorce on April 3 by his wife.

UNLUCKY.—Bacon—Do you think there's any luck in having a rabbit's foot?

Egbert—No; nor a hare-lip, either.—*Yonkers Statesman*.

SOLVED.—The world stood still not long since when a famed naturalist gravely announced that the primary function of the curl in the tip of a dog's tail was to enable the fleas to loop the loop.—*D. O. & Lab*.

ADVERTISING DOESN'T PAY.—Auguste Charles Valadier, a dentist in New York City, has filed a petition in bankruptcy, giving his liabilities as \$3,496 and his assets as nothing. One of the liabilities is \$1,710 for advertising.

NOSE TIME.—Professor (looking for fun): "Johnny, what time is it by your nose?"

Johnny (bootblack with chums around): "Mine ain't runnin'. Is yours?"—*Lippincott's*.

GAVE UP TEETH TO GET CASH.—April 12, a man was arrested at Easton, Pa., on the charge of passing worthless checks on dentists. His scheme was to have a tooth pulled and then tender a check of good size in payment, taking the difference in cash.

WHEN TO FIRE.—Israel Putnam—"Fire when you see the whites of their eyes."

Admiral Dewey—"When you are ready, Gridley, fire."

Admiral Rojestvensky—"You may fire when you see them spit on the bait."—*Baltimore World*.

SOLDER TEASER.—To make a convenient solder teaser, take a six-inch section of German silver tubing, same as is used for regulating appliances, spread the end a little, and insert about an inch of the lead from a lead pencil.—*A. E. Kellogg, Cresco, Iowa*.

BLISTERING FROM TINCTURE OF IODIN.—Claret (*Jour. de Méd. interne*) states that the application of starch, or even of ordinary flour, with enough water to make a paste, will, when applied to the injured surface, form starch iodid, which is harmless to the skin.—*N. Y. Med. Jour*.

REPAIRING A CLASP ON A RUBBER PLATE.—Sometimes a gold clasp can be soldered to its attachment on a rubber plate by suspending the plate in a glass of water and allowing the metal part to project through a hole in a piece of asbestos. This method, although limited in application, will be found useful in some cases.—MARK G. McELHINNEY, Ottawa, Canada, in *Review*.

HIGH PRICE FOR TEETH.—A New Yorker recently secured a verdict of \$2,500 from a local street railway company for the loss of two teeth which were knocked out in an accident.

PLATE RECOVERED BY OPERATION.—A New York sculptor some weeks ago swallowed a rubber plate carrying two teeth, which lodged in the esophagus and caused excruciating pain. It was recently located by means of the X-ray and removed by an operation. The patient is rapidly recovering.

MATTER OF FORM.—The dentist who is new to the profession, or to the town, or both, should not forget (and in the forgetting feel hurt) that it is his place to make the initial call on other practitioners, young or old—a matter of "good form" the very reverse of that which holds in the social world.—*D. O. & Lab.*

MURDERED GIRL IDENTIFIED.—Some weeks ago we printed a diagram and description of the teeth, fillings, etc., in the mouth of a young woman whose remains were found on Cutler Mountain near Colorado Springs, and who had undoubtedly been murdered. A woman in Syracuse, N. Y., has identified the remains as those of her daughter.

ADJUSTING THE RUBBER DAM.—Ligatures are not necessary to hold rubber dam in one case in a hundred. Turn in the edge at the cervical margin and the dam will remain in place. Patients dislike rubber dam harness, such as cloth holders, weights, etc. I threw mine out years ago.—**MARK G. McELHINNEY**, Ottawa, Canada, in *Review*.

NO TEETH FOR BRITISH SOLDIERS.—According to newspaper report, the British army council has decided to discontinue the experiment of providing recruits with artificial teeth. The soldiers would not pay for their teeth, as agreed, out of their pay of twenty-five cents a month, and when the military authorities tried to make them they decamped, teeth and all.

ADENOIDS IN INFANTS.—Herman Jarecky (*N. Y. Med. Jour.*) reported five cases of adenoids in infants, two eight weeks old, one nine weeks, one ten weeks, and one eight days. All were operated upon with success except the last, in which case operation was postponed to the age of four years on account of opposition by the father.

ALWAYS RETAIN THE CUSPID ROOTS.—In preparing the mouth for an artificial denture never extract the cuspids unless the upper lip is very short. The cuspid roots are usually easy to fill and can be covered with gold caps that stand flush with the gums. The plate can be fitted over these capped roots. In this way the expression is retained, which could not be reproduced when once these roots are removed.—**HOMER ALMON**, in *Review*.

FATALITIES.—Last month we stated that a man had died at Magnet, Neb., a few hours after having three teeth extracted. We have learned since that he had seven teeth extracted and that the work was done by a physician and not by a dentist. According to newspaper report the deceased showed all the symptoms of cocaine poisoning, but the coroner's jury did not find anyone responsible.—April 13, a farmer at Logan, W. Va., swallowed a set of false teeth while laughing, and died within an hour.

DENTISTRY BY MAIL.—We recently received the following letter from a man in Alabama—"The Dental Calage care the Dental Digest. Gentleman I desire to take A Course by mail in denistry for Pulling Plating and filling Teeth If you carry a Course of that Kind let me no as I want to began send tearmes and & full Instruction or give me the name of some school that do carry it."

ILLEGAL PRACTITIONERS.—Last month a man at San Jose, Cal., was fined \$50 for practising dentistry without a license.—April 13, a man at Los Angeles was fined \$50 for practising dentistry illegally.—April 5, the New Jersey Board brought suit against a Philadelphia dentist for practising in Trenton without a license, but the defendant showed that the office was in charge of a dentist registered in New Jersey.

HYGIENE OF THE GUMS.—To have good, satisfactory masticating teeth the gums must receive friction—through the food in eating or through rubbing in some manner—to insure perfect circulation. Teeth without gums are denuded teeth, and in many cases they are useless teeth. I look upon the proper care of the gums from the personal standpoint as of as much importance as the care of the teeth themselves.—A. W. HARLAN, *Items of Interest*.

MERCURIAL STOMATITIS.—(DR. OPPENHEIM, in *Wiener Med. Woch.*). He advocates the use of hydrogen dioxid solutions for the treatment of infectious stomatitis indirectly chargeable to the injection of large doses of mercury. He applies upon the ulcerated patches thirty per cent hydrogen dioxid. The patient is directed to use gargles of three per cent hydrogen dioxid. It has been his experience that after two days of this kind of treatment salivation and fetidity of the breath disappear, and the ulcerations begin to subside.

SWELLING IN THE SUBMAXILLARY REGION.—The recurrence of intermittent swelling in the submaxillary region, with or without pain, redness, tenderness, and fever due to suppuration, is very suggestive of the presence of a salivary calculus, usually in the submaxillary duct or gland. If pus can be expressed from the duct the diagnosis is more certain. The stone can usually be palpated, or located by passing into the duct the wire stiletto of an aspirating needle. Submaxillary mumps occurs sufficiently often to be also borne in mind in dealing with swellings in that location.—*Intern. Jour. of Surg.*

DIRECTION OF THE CONDENSING FORCE IN THE BUILDING OF LARGE CONTOUR FILLINGS.—In building out large restorations and contours the layers of gold should be laid on at right angles to the axis of the tooth, and most of the force of condensation should be applied in the direction of the axis rather than across it. Operators who follow this course, keeping the filling squared up, so to speak, will rarely have fillings cleave off through ordinary wear and tear; but if one gets into the habit of sloping the fillings so that the layers lie diagonally, if there be a weakness in the cohesion or welding there will be greater chances of a break. In building up a brick wall it is kept square or level. If one side were raised a little higher than the other, layer after layer, until there was a slope to the layers, the wall would not safely support itself. The same principle is involved to some extent in building up a contour filling. Keep it square up.—R. B. TULLER, *American*.

FULFILL CONTRACT OR NO PAY.—A dentist of Portland, Me., on April 15 lost a suit which he had brought against a woman patient. His claim was that he had made an agreement to do some bridgework for her for \$50, that when the work was partially completed he was short of money and asked for a deposit on the account, that she refused to give same and he thereupon stopped the work. The defendant afterward had the work completed by another dentist, and her claim was that the plaintiff made a contract with her which he did not fulfill. The court evidently agreed with her contention.

TEA AND COFFEE A CAUSE OF RHEUMATISM.—Dr. J. C. Walton, in an article on the prophylaxis and treatment of uric-acid conditions (*Charlotte Med. Jour.*), mentions a case of rheumatism in which, notwithstanding rigid diet and thoroughgoing treatment, no improvement was noticeable until after the patient gave up his coffee, when the disease promptly subsided. The writer states that he has observed a number of similar cases. This is quite in accord with Haig's theory that thein or caffeine produces the same pernicious effects in the body that uric acid does. Dr. Walton has observed excellent results from the use of hot air and other sweating procedures, followed by a graduated cold bath.

OCLUSION AND ARTICULATION.—The words "occlusion" and "articulation," so frequently quoted in dental literature, are often erroneously referred to. The term occlusion, for instance, is not uncommonly made to imply the several and distinct relations of the teeth as witnessed in the act of mastication, whereas in my conception the term can refer to only one movement, namely, the closing of the jaws. Occlusion therefore refers to the normal relations of the inclined occlusal planes of the teeth when the jaws are closed (Angle). Articulation, on the other hand, is a name applied collectively to the relations of the lower teeth to the upper as exhibited in the several movements performed by the mandible during mastication.—JULIO ENDELMAN, *International*.

DERMATITIS OF THE HAND AFTER USE OF X-RAY.—A severe case occurring in a physician who had employed the rays continuously since 1897 is reported by R. Mühsam (*Arch. f. klin. Chir.*). During the winter of 1900-'01 a dermatitis was observed, accompanied by scaling of the skin and localized temperature. The patient then ceased to employ the rays. The condition nevertheless grew worse, the nails became brittle and showed irregular growth, the skin was dry, and the hair fell out. The index finger of the right hand was most affected; here a paronychia resulted and the nail had to be removed. The wound failed to heal and an ulcer remained which was very painful and gradually extended, causing so much discomfort that the patient begged amputation of the finger. This was done, but the wound did not heal until nine weeks later. Examination of the digit microscopically showed the most marked changes in the vessels. The intima was very much relaxed, the endothelium swollen, and the surrounding tissue was markedly infiltrated. The changes amounted to an obliterating endarteritis. In the partial or complete obliteration of the vessels must be sought the reason for the slow healing of the ulcer.

ADAPTATION OF PARTIAL DENTURE TO REMAINING TEETH.—When only one or two teeth remain, as the two upper cuspids, for instance, a closer adaptation to the teeth may be secured by slightly trimming the plaster teeth and completely encircling them with soft or velum rubber. Pack the ordinary rubber around this and vulcanize as usual. In finishing use a sharp knife with both the knife and velum rubber wet. A snug adaptation will be attained, with a support superior to that given by clasps, and less harmful to tooth-structure.—P. B. McCULLOUGH, *International*.

GUTTA-PERCHA CONE IN ROOT-CANAL FILLING.—The difficulty of root-canal filling is enhanced when there is a large open foramen, but this may be overcome by the use of a section from a long hand-rolled cone of gutta-percha, tapering from one-eighth inch in diameter to a point. As the cone is pressed into the canal the sensation produced will indicate that apical tissue is reached. Withdraw the cone and cut off the end, introducing it again, and repeat the cutting until it can be introduced without sensation. Then cut off a little more, and fasten a section of suitable length on a flat-ended canal plugger by heating the plugger end, next moisten the canal with eucalyptol or chloro-percha and introduce the cone, packing it gently to place. We seldom find foramina so unformed that this method is unavailable.—O. E. INGLIS, *Stomatologist*.

MATERIAL FOR SEPARATING TEETH.—Some years ago a friend handed the writer a piece of material which was the very best thing he has ever seen for separating teeth. He has never been able to learn who the originator was, but it is prepared in the following way: Linen tape of the proper width is soaked in thin chloro-percha till it becomes saturated. After the chloroform is evaporated it leaves what is practically a gutta-percha tape, the very toughest and most effective material that has ever been suggested. It does not disintegrate like linen alone, it will remain in place perfectly, and it does not cause irritation to the soft tissues. Its action, while very effectual, is so gradual that patients seldom or never complain of the least discomfort. The originator of so excellent an idea should have due credit for it, and it is hoped that his name may be announced as the result of this article.—*Review*.

NEW METHOD OF SOLDERING.—Take of filings of an easy-flowing solder and filings of the gold to be soldered or some higher fusing metal, about equal parts, also borax and water rubbed up in a mortar or otherwise to make a creamy solution. Mix the filings with sufficient borax solution to make a thick paste. Pack the joint to be soldered with this paste, and heat till fused. Care should be taken that the entire mass is evenly heated throughout, and of course all the ordinary precautions of having surfaces bright and clean, etc., must be observed. This method is especially adapted when large spaces are to be bridged, or where it is desirable to add to a cusp or to contour, or otherwise change the space of a piece in any way. Almost any form desired may be obtained, due allowance being made for shrinkage. The particles of high-fusing metal serve as a support to retain the shape of the mass, and the low-fusing solder acts as a cement when fused to unite these particles and bind them to the piece being soldered.—F. W. STEPHAN, *Summary*.

FINGER-RUB MAY CAUSE LOST SIGHT.—J. H. Minard, a dentist of New York City, has had to give up practice temporarily because of trouble with one of his eyes. Several months ago while working on a patient in the chair his eye itched and he rubbed the lid with his finger. Infectious matter was evidently carried in this way from the patient's mouth to the dentist's eye, as the latter soon became inflamed. Treatment gave relief for a time, but recently a relapse occurred, so that he has to give up practice for the time being.

FIRES.—R. Sullivan, Selma, Ala., April 25, loss \$1,500.—A. E. Boyce, Tuscola, Ill., April 22, loss \$500, partly insured.—Guy Bergen, Frankfort, Ind., April 15, loss \$400, fully insured.—John Vaughan, Terre Haute, April 23, loss \$100.—G. H. Wooton, Akron, Ia., April 4, loss \$800.—F. W. Nunn, Marion, Ky., March 28, loss \$1,000, insurance \$500.—H. J. Cleveland, Orange, Mass., April 5, loss \$400.—R. R. Ellingwood, Boston, Mass., April 17, loss \$200.—S. K. Miahian, Sunfield, Mich., April 12, loss \$400.—H. O. Barnes, Lowell, Mich., April 13, loss \$1,000, insurance \$800.—J. E. W. Bissell, Westfield, N. Y., April 20, loss \$1,000.—Sam Hunt, Trenton, Tenn., April 24, loss \$700, insurance \$500.

DAMAGES.—April 14, a dentist at Waterbury, Conn., was sued for \$5,000 damages by a woman who claims that because of his unskillful extraction of some teeth about a year ago blood-poisoning set in and she has because of it lost the use of one arm.—April 8, a man at Schuylerville, N. Y., sued a New York dentist for \$5,000 damages, alleging that because of unskillful treatment he has lost the use of all his teeth.—April 15, a woman at Providence, R. I., sued a dental parlor in that city for \$2,000 damages, alleging that because of unskillful extraction of a tooth necrosis of the jaw resulted.—April 18, a woman in Providence sued a dental parlor to recover \$5,000 damages, claiming that one of the operators splintered her jaw while extracting a tooth, and that she has since then had to undergo three operations and is permanently disfigured.

BOY'S ESSAY ON DENTISTS.—The dentist is a man with a pare uv pinchers whot pullz yer teeth fust an' yer legg afterwards. Paneless dentist are men whot pullz teethe without hirtin' themselves a bit. Men, wimin an' gurls goze to dentistz butt hoarses has thayre teethe pulled by vetinery sirgins. Thay ain't no dentistz fer doggs an' chickens doan't nede nun fer thay aint got no henz teeth. Boys have thayre teethe pulled ginrally by gittin' 'em ienocked out. The dentist lerns to dent in a collige an' then he gits a offise an' hyres a prettie gurl to hand you a magazine an' say; "Set down, pleze. The dockter will be threw sune. It's a pleasant day, ain't it?" One day mi mother tuk gas to have a tooth pulled an' mi fathir an' me stood by an' seen it did. When she cum to, she sez, "Hennery, how did I act?" "Grat," sez mi fathir, "you never said a wird." Mi mother loked at him hard. "Hennery," she sez, "whot did you mene by that?" "Oh, nothin' much," sez he, "only I wiset I had sum uv that gas up at the house." Then he laffed. "Ten dollars," sez the dentist. Then mi fathir quit laffin' an' cut out all merriment fer the rest of the weke.

THINGS TO KNOW.—Greenland is one of the very few countries where infectious diseases are unknown.

A white disk a foot across can be seen with the naked eye at a distance of 17,250 feet.

There are twenty-eight pounds of blood in the body of the average grown-up person, and at each pulsation the heart moves ten pounds.

Rice, raw eggs and venison are the easiest to digest. At the other end of the scale are pork, cabbage, and hard-boiled eggs, which take about four hours to digest.—*Exchange*.

ACCIDENTS.—April 10, a dentist at Rome, Ga., administered chloroform to a man previous to extracting a tooth. Just as the tooth was being drawn the man kicked out with his foot and struck the dentist in the side, breaking two ribs.—April 10, a vulcanizer exploded in the office of a dentist at La Harpe, Ill., but fortunately did little damage.—Last month a man at Decorah, Ia., almost died from hemorrhage following the extraction of one tooth.—April 14, a vulcanizer exploded in the office of Dr. M. S. Campbell at East Lynn, Mass., and severely scalded him.—Last month a man at Troy, N. Y., while having some dental work done swallowed a bur which dropped from the handpiece into his mouth. As yet it has not been located, but has caused no trouble.—April 13, the vulcanizer in the office of Dr. A. J. Walters at Canton, Pa., exploded and wrecked the office.

BABY'S TOOTH CAUSES EXCITEMENT.—A baby in St. Louis recently cut a tooth, assisted by a dentist, a physician and the fire department. Just before the tooth appeared the baby was seized with a spasm, and the father, thinking the little one was dying, rushed from the house in his nightclothes at 5 o'clock in the morning to a doctor's office. The driver of a milk wagon who was passing at the time thought that nothing but a fire would cause a man to appear at that hour on the street in his nightshirt, so he turned in an alarm. A dentist living near heard the commotion and rushed in to offer his services, so when the father returned with the physician he found the dentist and the fire department already there. The baby meanwhile had cut its tooth and gone to sleep.

THE LIFE STORY.—

What do we get

For the toil o' the years?

Shadow—and sunshine

That glimmers through tears!

Singing and sighing

Along the brief way—

Storms o' the winter,

And dreams o' the May.

Strife o' the battle—

The wrong and the right;

Life in a gallop—

"Good morning—Good night!"—*Frank L. Stanton.*

MIGHT HAVE BEEN WORSE.—'Twas a dark and dismal evening.

The wintry winds howled mournfully without as the man within picked up a keen-edged tool.

"One more mouth to fill," he muttered.

But his muttering was more cheerful than otherwise, for he was a dentist and the \$5 filling represented a net profit of \$4.97.

'Twas a dark and dismal evening.—*Chicago News*.

REPAIRING A BRIDGE.—When called upon to quickly repair a bridge containing porcelain facings, where a band may have split or a crown worn through at the occlusal surface, to avoid investing and unnecessary delay the following method will be found effective: Clean the bridge thoroughly and wrap securely about the facings a sufficient amount of asbestos fiber to fully protect them. Grasp the bridge at this point with pliers in such manner as to hold the bridge and asbestos securely. Hold the part to be soldered over a Bunsen flame and by careful handling the solder will flow where wanted. Allow parts to cool before removing asbestos and there will be no danger of checking the facings.—LOUIS S. LA PIERRE, South Bend, Ind., in *Review*.

ETIOLOGY AND TREATMENT OF BUCCO-LINGUAL LEUCOPLAKIA.—(Dr. Bockhardt, in *Jour. für Zahnheil.*). Author has observed sixty cases of bucco-lingual leucoplakia exclusively upon men. All were syphilitics and smokers. He therefore insists that these two factors play a responsible part in the production of this disturbance. However, the treatment of leucoplakia does not respond to antisiphilitic medication; on the contrary, this at times aggravates the intensity of the disease. The treatment should consist primarily in the abandonment of the smoking habit, and in daily rubbings of the diseased areas with balsam of Peru. The author records several cases of complete cure in from six months to one year's time, to such an extent that in certain patients the tongue regained entirely its original normal aspect.

FIBROUS POLYPUS IN THE HARD PALATE.—(C. H. WHITEFORD, in *Brit. Dent. Jour.*). The author reports a case of a woman, aged thirty-two, affected with a smooth circular tumor, the size of a sixpenny piece and half an inch in thickness, upon the right side of the hard palate, to which it was attached by a short pedicle one-sixth inch in thickness and one-fourth inch in length. The attachment was opposite the lateral incisor. The circular form of the growth was due to the suction depression in the tooth-plate. Under ethyl chlorid and ether the growth was removed by dividing the pedicle, after which many carious teeth were removed by a dental surgeon. Two smaller growths the size of split peas were also removed, and several minute polypus were noticed scattered over the hard palate. All the growths appeared vascular prior to the application of adrenalin chlorid 1 to 1,000, as a result of which the hemorrhage from the palate and gum was very slight. The clinical microscopic examination showed that the tumor was a simple fibrous polypus of the palate consisting of wavy fibrous tissue covered with squamous epithelium, and was not of the malignant type. Mr. Bland Sutton is of the opinion that such growths are frequently due to irritation caused by plates.

NECROSIS OF THE JAWS.—Necrosis in the lower jaw is more frequently met with than in the upper, most likely due to the greater vascularity of the latter. It is generally the effect of unchecked suppurative periostitis, the pus separating the membrane from the bone, and in this way cutting off the vascular supply, death of the bone occurring rapidly. Necrosis may be complete, involving the whole thickness of the bone, or partial, limited to the alveolar process. The symptoms of impending necrosis are those of periostitis—severe pain, increased heat, rapid swelling—and here much may be done by prompt action, incisions, extraction of teeth, and hot fomentations. After necrosis has been established, the pus finds its way out by the side of loosened teeth, or wells up between the bone and the gum; or it may burrow deep into the neck and point near the angle of the jaw. The pus has the characteristic fetor of that from dead bone. A fistulous external orifice becomes established, and on using a silver probe it comes in contact with the necrosed portion of bone sequestrum.—W. G. ANGLIN, *Dominion*.

RADIO-ACTIVE WOOL.—A new method of employing radium in medicine has been described (*Canadian Jour. of Med. & Surg.*) by E. S. London, a Russian physician, which consists of using cotton-wool which has been submitted to the reaction of radium emanation. The result of a series of experiments seems to justify the conclusion that the effects of the radium emanation and of the direct action of the radium are the same, consisting in an inflammation of the skin and a destruction of protoplasm. Wool so treated, which is convenient for easy distribution over the body, when packed in hermetically sealed jars or other containing vessels, loses its radio-activity very slowly, and can be sent to any distance desired. From a few milligrams of radium a large quantity of wool may be prepared, and thus widely extend the use of a small amount of radium, whose cost is so great as to interfere with its widespread use. Radio-active wool may therefore become a stock pharmaceutical preparation, but it still remains for the medical profession to determine its therapeutic value.

PRECAUTIONS FREQUENTLY DISREGARDED IN ADMINISTERING NITROUS OXID.—I am in the habit of teaching that nitrous oxid should never be administered to a patient (1) with a loaded stomach, *i. e.*, within an hour of a meal; (2) with a full bladder; (3) with a tight neckband or tight lacing. These conditions, however, are repeatedly neglected in practice, and thus vomiting into the facepiece (with its attendant risk of asphyxia), micturition, cyanosis, and obstructed respiration should not be attributed to the N_2O , but to the neglect of the simplest elementary precautions prior to its administration! One is frequently tempted, in order to obtain a long anesthesia with N_2O , to continue the administration a little too far—on to the borderland of asphyxia, in which cyanosis, deep stertor, violent jactitation, opisthotonos, and a widely dilated pupil with insensitive conjunctiva are present, but this I feel sure defeats its own object and that time is lost, on account of the erratic movements and the awkward position into which the patient may subside in the chair, much handicapping the operator during extractions. It has been my custom for several years to stop the administration when I witness the presence of

twitchings in the orbicularis oculi muscle at the external canthus. I believe this to be an invariable sign of anesthesia with N_2O , and I cannot recall any case in the adult where it has not been present. In young children the signs of anesthesia follow one another so rapidly that I have not found this sign so reliable; in their case it is advisable to stop the administration directly any sign of muscular twitching is present, otherwise arching of the back may follow very rapidly and the patient slip out of the chair on to the floor. Caution is also necessary in the case of phthisical patients, to stop the administration on the first sign of anesthesia and not to push the anesthetic; such patients are said to become more deeply anesthetized when the administration is stopped and air admitted. This fact is in all probability due to defective elimination from the damaged lung; it is an undisputed fact that they do become more deeply anesthetized after removal of the face-piece, a phenomenon at variance with all experience with other anesthetics.—C. CARTER BRAINE, *Brit. Dent. Jour.*

TO MAKE CHILDREN'S TEETH CUT.—According to the quaint work of old Nicholas Culpepper, "Take the tooth of a Colt of a Yeare old, and hang it about the neck of the Child, and this will doe it, if Minzaldus say true. And now give me leave to quote an experiment of my own; one of my children breeding teeth extreme hardly, it seemed to be impossible to get a Colt's tooth (of a yeare old), wherefore I bought a Calves head and took of its teeth and hung about its (!) neck, and the very first night three of its teeth cut, which, because it's very unusuall so many teeth should cut in one night, I cannot but ascribe some virtue to the medicine. Besides all this, I am of the opinion that the Tooth of a dead man hung about the neck of a Child will doe it far better than either. I am not determined to give my reasons at this time, yet will I give you a verisimile for it; the Tooth of a dead man borne about a man instantly suppresseth the pains of the teeth, as I have found myselfe, when all other remedies have failed me, and if this be true, why not the other?"—*Brit. Jour. Dent. Sc.*

ETHYL CHLORID.—Ethyl chlorid has come much to the front during the last year or two as a general anesthetic in dental surgery, and one is apt to imagine that a new anesthetic has been discovered, whereas it was used by Heyfelder as a general anesthetic as far back as the year 1848. No anesthetic is being so extensively advertised at the present day as ethyl chlorid, and every firm of manufacturing chemists appears to also have discovered, in their own opinion, the best inhaler for its administration. I am not aware of any anesthetic reagent to which so many fancy names have been attached. The use of such terms is a mistake, and it leads one to suppose they are proprietary articles; ethyl chlorid should be known by that name and no other. It possesses many advantages over N_2O , as it produces insensibility with very great rapidity, the resulting anesthesia is of much longer duration, sometimes more than twice as long, and the character of the anesthesia is of a deeper and a more tranquil nature; besides these advantages, its portability in comparison with the gas cylinder is greatly in its favor. It is not uncommon to obtain two minutes' anesthesia after its inhalation, so that it will

at once be recognized how useful this anesthetic is in dental surgery during difficult extractions; it is also admirably suited for the removal of tonsils and adenoids in children, the time at the disposal of the surgeon being ample. Although possessing all these good points, it has one disadvantage, and that is the tendency to after-sickness. You can never predict that it will not occur, and I have met with a few cases in which it has been very troublesome, lasting quite half a day; therefore I do not administer ethyl chlorid if there be a fair chance of completing the extractions under nitrous oxid and oxygen.—C. CARTER BRAINE, *Brit. Dent. Jour.*

STARTING GOLD FILLINGS.—The latest method which I have been using in the preparation of cavities to be filled with gold suggested itself to me through the use of the porcelain inlay matrix. It consists in making the cavity retentive, but without the deep grooving or retaining pit, making just enough undercut to retain the finished filling. I then take a piece of No. 30 gold foil, large enough to suit the case, then proceed the same as in making the matrix for a porcelain inlay, pressing the foil in absolute contact with the cavity walls and margins, the latter being beveled as is usually done for a gold filling, the excess being pressed out over the exposed surfaces of the tooth, i. e., the enamel. It may sometimes be necessary to ligate the matrix in position until you have partially filled the cavity, but I have never found this necessary, because of the close adaptation of the foil to all surfaces. Those of you who have experienced the difficulty which attends the removal of a properly prepared matrix even where no undercuts exist, will readily see how this matrix will keep its place throughout the operation. I then pack soft gold into the slight undercuts and upon the floor and walls of the cavity, finishing with cohesive. Only the smallest amount of undercutting is necessary if made in the right place, thereby reducing the encroachment upon the pulp to a minimum, which must be acknowledged to be a great consideration, especially in deep-seated cavities. The exposed surface of the matrix should be wiped off with alcohol and chloroform, and dried with hot air before commencing the packing of the gold.—W. I. SCHREIBER, *Summary*.

MARRIAGES.—Clarence Beard, a dentist of Waynesboro, Pa., was married to Miss Catharine D. Welty of Waynesboro, April 11.—J. W. Cutler, a dentist of Chanute, Kan., was married to Miss Edna Bartl of Chanute, April 10.—Zacherie Endlitz, a dentist of Paris, France, was married to Miss Minnie De Haan of Philadelphia, April 17.—H. D. Gleaves, a dentist of Los Angeles, was married to Miss Laura Campbell of Anaheim, Cal., April 2.—Alice Connnett, a dentist at Fort Wayne, Ind., was married to Rutherford B. Hayes of Fort Wayne, April 5.—Frank R. Houston, a dentist of Green Bay, Wis., was married to Miss Jessie Gray of Green Bay, April 11.—W. H. Hall, a dentist of Butte, Mont., was married to Mrs. P. S. Miller of Los Angeles, March 22.—A. I. Parker, a dentist of Barbourville, Ky., was married to Miss Harriet Teague of Teague, Ky., April 20.—Joseph O. Rafferty, a dentist of Chicago, was married to Miss Grace F. Stephens of West Chicago, April 27.—W. J. Rice, a dentist of Mason City, Ia., was married to Mrs. Ray Speak of Mason City, April 22.—Fred H. Riley, a dentist of Kansas City,

Mo., was married to Miss Libby Beets of Fort Scott, Kan., April 23.—R. J. Siegmund, a dentist at Shoals, Ind., was married to Miss Grace Shanks of Mitchell, Ind., April 16.—E. E. Snow, a dentist of East Tawas, Mich., was married to Miss Anna Graham of Charlotte, Mich., April 3.—Holland Wight, a dentist of Park City, Utah, was married to Miss Mabel E. Green of Homer, N. Y., April 26.

EXAMINING BOARD AFFAIRS.—March 22, C. E. Rohne of Douglas, Ariz., was appointed a member of the Territorial Board.—April 5, a judge in San Francisco issued an order directing the secretary of the California Board to issue a temporary certificate to a dentist from Chicago, giving him the right to practice until the next meeting of the board for examination.—At the March meeting of the Massachusetts Board 22 out of 58 applicants were successful in passing the examination.—At the last meeting of the Minnesota Board S. R. Holden of Duluth was elected president and F. S. James of Winona secretary and treasurer. Eleven out of 18 applicants were successful in passing the examination.—April 8, the governor appointed D. Bridgeforth of Richmond and J. A. Colvin of Charlottesville members of the Virginia Board.—The proprietor of a dental parlor at Sioux Falls has brought suit to compel the South Dakota Board to issue him a license without making him take the examination which is necessary according to the state law.—The proprietor of a dental parlor at Seattle, Wash., failed to pass the examination some months ago, and since then he has been trying to force the board to grant him a license, claiming that he failed to pass not because of his lack of knowledge but because he would not sign a pledge to abide by the code of ethics. The supreme court has just decided that his allegations were not substantiated by the evidence.

ROBBERIES.—George Bennett, Sacramento, Cal., March 27, \$50 by footpads in San Francisco.—W. H. Loomis, Rockville, Conn., April 8, \$250.—L. A. Jones, Alton, Ill., April 17, \$40. The thief was an employe and was caught.—A. L. Shockley, New Bedford, Mass., April 1, \$50.—F. N. Ashley, New Bedford, Mass., April 1, \$35.—J. F. Light, Waltham, Mass., April 29, \$25.—R. J. Hare, Waltham, Mass., April 23, \$25.—Huckins & Edwards, Watertown, Mass., April 23, \$12.—A. J. Flanagan, Springfield, Mass., April 9, \$116.—L. Y. Schermerhorn, Springfield, Mass., April 9, \$35.—C. M. Saville, Holyoke, Mass., April 9, \$20.—M. A. Schooley, Kansas City, April 25, \$50.—George S. McLaughlin, New Brunswick, N. J. April 15, \$65.—New York Dental Parlors, Trenton, N. J., April 8, \$100.—E. C. Condict, Trenton, N. J., April 8, \$60.—April 15 the offices of several dentists at Elmira, N. Y., were entered by thieves, but in most of them nothing was taken, as the gold had been locked up or hidden.—April 17 five dental offices at Ithaca, N. Y., were burglarized and about \$27 secured.—William S. Teller, Newburgh, N. Y., April 19, \$100.—C. D. Kennedy, New York, April 13, \$250.—H. M. Marlatt, Belle Center, O., April 18, \$30.—F. W. Monroe, Chester, Pa., April 3, \$100.—L. M. Breck, El Paso, Tex., April 4, \$75.—M. Field, Petersburg, Va., April 22, \$25.